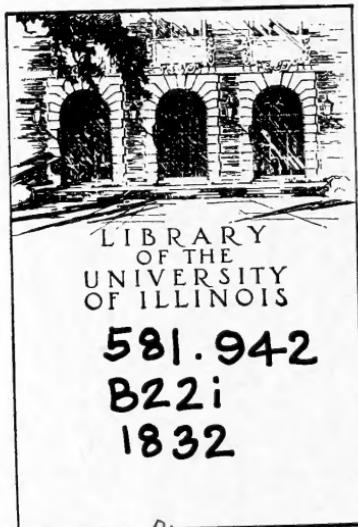


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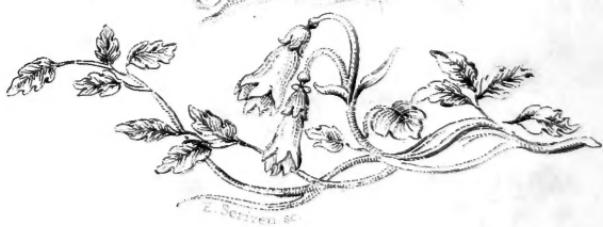
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L I N N E U S.

AN  
INTRODUCTION  
TO THE  
**STUDY OF ENGLISH BOTANY;**  
WITH A GLOSSARY OF TERMS.

ILLUSTRATED BY THIRTY-SEVEN PLATES.

BY  
**GEORGE BANKS, F.L.S.**  
AUTHOR OF THE PLYMOUTH AND DEVONPORT FLORA.

SECOND EDITION.

**London:**

HENRY WASHBOURNE, SALISBURY-SQUARE ;  
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1832

TO

WILLIAM JACKSON HOOKER,

L. L. D. F. R. A. & L. S.

REGIUS PROFESSOR OF BOTANY IN THE UNIVERSITY OF GLASGOW,

THIS SECOND EDITION IS INSCRIBED,

AS

A TESTIMONY OF GRATITUDE AND ESTEEM,

BY THE AUTHOR.

Devonport, Sept. 1832.

gives 25 Dec 1846 - 1832



## INTRODUCTION.

WHEN man was exiled from that blissful garden where every tree was “pleasant to the sight or good for food,” and doomed “to eat the herb of the field” where it grew amidst “thorns and thistles,” necessity made him a Botanist. He learned to separate the nutritious from the noxious ; and when pain and sickness assailed him, he sought the balsam and the balm.

The science of Economical Botany, teaching us to supply our wants from the stores of vegetable nature, has been known in all ages, and is diffused over every quarter of the world.

But Nature is beautiful no less than benign. The lowliest herb that fringes her green mantle is a work of wonder ; and it is to contemplate such works as these that Botany, apart from its economical purposes, invites us.

If it be objected that no practical benefit arises from the science thus considered ; if it be said that this sort of Botany is of no use ; the reply should

be, that as air and exercise are salutary to the body, it is useful to encourage a taste for a pursuit which tempts its votaries abroad. The sports of the field are applauded on this account ; but these are the privilege of the few ; of those who are among the rich, and who are blessed with health and strength and the full tide of spirits which the rude exercise demands : but the gentle charm which calls the Botanist into the fields and woods operates upon the tender and dejected, as well as the robust and joyous ; and many a valetudinarian, who has wanted an inducement to walk, would have found it in the pursuit of Botany.

It is moreover to be urged, that a taste for simple pleasures is salutary to the mind ; that men who love to contemplate the works of nature learn to look with less longing eyes upon the enticements of the world ; and that the most eminent of naturalists have been found among the most amiable of men. Finally, if the authority of a great name be demanded to countenance the rationality of the pursuit, let it be remembered, that the wisest of mankind, he whose glorious raiment was less lovely than the *lily*, did not disdain “ to speak of trees,” from the cedar that waved over Libanus to the hyssop that grew upon the wall ; and that the Royal Botanist included in his scope still humbler vegetables ; for it has been suggested, that the word which in our bible is translated Hyssop,

might, with more propriety, have been rendered a Moss.

Wide as the vegetable kingdom extends, we should wander unprofitably over it without a guide ; and many are the celebrated names of men, who, traversing the rich territory, have felt the disadvantage of wanting a *map* to direct them. Happily, however, they have, by recording their discoveries, left no such disadvantage to be felt by us. The earlier sketches of the country were but rude. Successive efforts improved upon them ; but the Linnean survey now indicates the track which the botanical traveller may henceforth confidently pursue.

Botanical writers have so generally adopted the system which Linneus devised, that, without some knowledge of that system, their treatises would not be intelligible to us, and the description of a plant in Linnean language would convey no image whatever to our minds.

The business of the following pages shall therefore be to explain the Linnean arrangement, and to enable the student to attach to every term its appropriate idea.

To possess this ability is, in truth, to have mastered the mysteries of the Science ; and a few

short lines, to which even a young botanist thus initiated might readily turn, in any competent book, would then be sufficient to afford him the name and history of any plant that should attract his attention, from the humble tenant of the hedge-bank, to the proudest ornament of the conservatory.

Linneus has divided the vegetable creation into Classes, Orders, Genera, and Species.

He perceived that neither the stature of plants, their substance, general form, nor any other qualities which had been previously considered, denoted with any accuracy the true limits of classification; but that in every system which had been projected, Fancy prevailed so much, that Science was scarcely to be discerned.

It was reserved for him to detect, in the minute and latent organs of *Fructification*, a principle pervading vegetable life, and *admitting various modifications capable of exact definition*: and, availing himself of this principle, he has founded upon it the beautiful system which bears his name.

## FRUCTIFICATION.

THE FRUCTIFICATION consists of the Flower and Fruit. It is not a permanent part of any vegetable; but disappears upon the ripening of the seeds.

The Parts of Fructification are seven: the CALYX, COROLLA, STAMENS, PISTILS, PERI-CARP, RECEPTACLE, and SEEDS.

Every individual flower does not possess all of these. In some the Calyx is wanting, in some the Corolla; and in others other deficiencies occur.

The CALYX is that exterior part of a flower which encloses the Corolla previously to its expansion, and afterwards embraces and supports it.  
fig. 1, pl. 1.

The COROLLA consists of a leaf or leaves, termed petals, situated within the calyx. fig. 1. *a*

The STAMENS are thread-like substances, enlarged at their summits, erect within the corolla.  
fig. 2.

The **PISTIL** is a slender column crowned with its capital, standing in the very centre of the flower. fig. 3.

The **PERICARP** is the substance out of which the pistil proceeds, and in which the seeds are contained. figs. 4, 5.

The **RECEPTACLE** is the base upon which all the other parts of fructification rest.

Finally, the **SEEDS** for the forming, protecting, and perfecting of which the whole process of fructification is designed, are the Rudiments of new Plants. fig. 6.

Each of these parts of fructification assumes in different plants very different appearances.

Of the **CALYX** there are seven principal varieties.

1. The *Perianth*, conveying more clearly than any other species of calyx the idea of a Cup, as in the Cowslip, *Primula veris*, fig. 1, pl. 2.

It is either

Single, as in *Primula*, fig. 1, pl. 3.

Double, as in Mallow, (*Malva*) and Althæa,  
figs. 2, 3.

Imbricated (composed of many leaves overlapping each other) as in Cat's-ear, (*Hypochæris*) fig. 4. and Thistle, (*Carduus*) fig. 5.

Longer than the corolla, as in Corn-cockle, (*Agrostemma Githago*) fig. 6.

Equal in length, as in Mouse-ear-chickweed, (*Cerastium*) fig. 7. *a* or

Shorter, as in Bindweed, (*Convolvulus*) fig. 8.

It is either

Monophyllous, (formed of one leaf) as in Champion, (*Lychnis*) fig. 1, pl. 4.

Diphyllous, (of two leaves) as in Poppy, (*Papaver*) fig. 2.

Triphyllous, (of three) as in Water-plantain, (*Alisma*) fig. 3.

Tetraphyllous, (of four) as in the Wall-flower, (*Cheiranthus*) fig. 4.

Pentaphyllous, (of five) as in Ranunculus, fig. 5.

Hexaphyllous, &c.

A Monophyllous Perianth is either

Entire, (undivided)

Bifid, (divided into two segments)

Trifid, (into three segments)

Quadrifid, (into four) or

Pentafid (into five) as figs. 6, 7, 8.

The segments are either equal or unequal :

Equal, as in Centaury, (*Chironia*) fig. 6. Periwinkle, (*Vinca*) fig. 7. and Corn-cockle, fig. 8.

Unequal, as in Cinquefoil, (*Potentilla*) fig. 9. and Wild balm, (*Melittis*) fig. 10.

Tooth-like, as in Campion, fig. 1.

Subulate (awl-shaped) as in Greater-periwinkle, (*Vinca major*) fig. 7, or long and leaf-like, as in Corn-cockle, fig. 8.

A Polyphyllous Perianth is either equal or unequal:

Equal, as in Wall-flower, (*Cheiranthus*) fig 1, pl. 5.

Unequal, as in Field Gentian, (*Gentiana campestris*) fig. 2, pl. 5, where the two inner leaves are much smaller than the outer.

The general form of the Perianth is either

Erect, as in Soap-wort, (*Saponaria*) fig. 3, pl. 5.

Globose, as in Knapweed, (*Centaurea*) fig. 4.

Inflated, as in Yellow-rattle, (*Rhinanthus*) fig. 5.

Expanded, as in *Ranunculus acris*, (one of the plants commonly called Butter-cups) fig. 6.

Reflexed, as in *Ranunculus bulbosus*, (another of the Butter-cups generally confounded with the preceding) fig. 7.

The Perianth is generally placed below the Germen (the name by which the pericarp is called before it grows to maturity,) but is sometimes above it, as in Brookweed, (*Samolus*) fig. 8, and the flowers of the Apple-tree, on the fruit of which it may be generally seen.

2. The *Involucre* is remote from the corolla, and placed at the foot of what is called an Umbel; a collection of flower-stalks, diverging from one point, fig. 2, pl. 2.

It consists either of one or more leaves, and is called, according to their number, Monophyllous, Diphylloous, &c. When placed at the foot of the general umbel, fig. 2, *a* it is called a general involucre; and when at the foot of a partial umbel, fig. 2, *b* it is called a partial involucre.

These involucres are not always present: in Cowparsley, (*Chæropodium*) the partial involucre only is present, fig. 1, pl. 6; in Parsnip, (*Pastinaca*) both general and partial involucres are wanting.\*

3. The *Catkin* consists of many leaves (leaflets) attached to a thread-like receptacle, as in the Hasel, (*Corylus*) fig. 3, pl. 2.

In those plants where the Catkin contains seeds, it hardens and enlarges, and is a permanent protection for them until ripe; but in others, in which the catkin contains stamens only, it falls off as soon as the Anthers have shed their pollen: (an

\* The green leaves which surround the florets of compound flowers, such as the Daisy, Dandelion, and Blue-bottle, are also designated an Involucro. Fig. 1, *a* pl. 19.

explanation of these terms will be given under the head of Stamens.) The Fir is an instance of the former kind, fig. 2, pl. 6; and the Hasel of the latter, fig. 3, pl. 2.

4. The *Sheath*, which opens at the side, as the corolla bursts forth, as in the Snow-drop, (*Galanthus*) fig. 4, pl. 2; and Arum, fig. 3, pl. 6.

5. The *Husk*, or Glume, the chaffy calyx of Corn and the grasses, fig. 5, pl. 2.

It consists of one valve in Rye-grass (*Lolium*); of two in Oat-grass, (*Avena*) fig. 4, pl. 6; or of three in Panic-grass, (*Panicum*) fig. 5. The valves are unequal in *Avena*, fig. 4; equal in Foxtail-grass, (*Alopecurus*) fig. 6.

These valves are often furnished with awns or beards, as in Wheat-grass, (*Triticum*) fig. 7.

6. The *Perichaetium*, or scaly sheath, investing the fruit stalks of Mosses, fig. 6, pl. 2.

7. The *Volva*, or Curtain, covering that part of the plant, (the under part) in which the fructification is contained, as in some species of mush-

room, and afterwards bursting as the plant enlarges, and frequently leaving a lacerated ring upon the stalk. fig. 7, pl. 2.

The Calyx either falls off at the first opening of the petals, after their expansion and before the dropping of the flower, or continues with the seed. The terms employed to express these periods of duration are Caducous, Deciduous, Persistent.

The COROLLA is either

Monopetalous, as in Deadly nightshade (*Atropa*)  
fig. 1, pl. 1.

Dipetalous, of two petals, as in Enchanter's  
nightshade, (*Circea*) fig. 1, pl. 7.

Tripetalous, of three, as in Frog-bit, (*Hydro-  
charis*,) fig. 2.

Tetrapetalous, of four, as in Wall-flower, fig. 3.

Pentapetalous, of five, as in Cistus, fig. 4.

Polypetalous, of many petals, as in Water-lily,  
(*Nymphæa*) fig. 5.

A Monopetalous corolla consists of two parts :

The Tube, *a* and the Limb, *b* fig. 3, pl. 8.

It is either

Campanulate, bell-shaped, as in Bell-flower,  
(*Campanula*) fig. 1.

Funnel-shaped, as in Thorn-apple, (*Datura*) fig. 2.

Salver-shaped, as in Primrose, (*Primula*) fig. 3, in which latter the segments are equal, and it is therefore termed a regular monopetalous corolla.

Rotate, wheel-shaped, as in Speedwell (*Veronica*) fig. 4, in which the segments are unequal, and it is termed an irregular monopetalous corolla.  
Tubular, as in Honeysuckle, (*Lonicera*) fig. 5, and the central florets of Ox-eye (*Chrysanthemum*) fig. 6.

Ligulate, strap-shaped, as in Dandelion, (*Leontodon*) fig. 7.

Ringent, gaping, as in Dead-nettle, (*Lamium*) fig. 1, pl. 9.

Personate, closed at the mouth, as in Snap dragon, (*Antirrhinum*) fig. 2.

A Polypetalous corolla is termed regular when consisting of petals equal in size and similar in shape :

Irregular, when otherwise, as in the violet, (*Viola*) fig. 3.

It is termed cruciform when composed of four equal petals placed crosswise, as in the Wall-flower, fig. 3. pl. 7.

Papilionaceous, when the petals are so formed and disposed as to resemble a Butterfly, fig. 4, pl. 9.

The petals of a papilionaceous Corolla are thus named: the Banner, fig. 5; the Wings, 6; the Keel, 7.

Each petal of a polypetalous Corolla consists of two parts; the Claw, fig. 5, *a* and the Plate or upper and expanded portion of the petal. *b*

The Corolla either falls off immediately on its expansion, or with the stamens and pistils.

To the Corolla is frequently attached an organ termed the Nectary.

The Nectary is that part of the flower which retains or secretes the honey. Scarcely any flower can be found without more or less honey; though its secretion is not universally produced by an organ distinct from the petals.

In monopetalous flowers, the tube of the Corolla contains and probably secretes the honey without any evident nectary, as in the Dead-nettle. Sometimes it is an elongation of the Corolla, as in the Violet, fig. 1, pl. 10, and Snap-dragon, fig. 2; and sometimes distinct, as in Columbine (*Aquilegia*) fig. 3. *a* It crowns the Corolla in Narcissus, fig. 4; is attached to the claw of the petal in Ranunculus, fig. 5, *a* and to the receptacle in House-leek, (*Sempervivum*.)

The most unequivocal of all nectaries, as actually secreting honey, are those of a glandular kind ; as in cruciform flowers, where there are generally four glands at the base of the stamens, as in *Brassica*, (Cabbage.)

The term Nectary appears indeed to be resorted to by Botanists when a flower possesses an organ which cannot be actually ranged under either of the seven heads of fructification. In other words, if a flower be so constructed that some particular member of it does not properly belong to either of the regular parts of fructification, that member is usually and arbitrarily termed a nectary.

Having thus considered the Calyx and Corolla, it remains to be observed, that in certain flowers in which one of these is wanting, it is sometimes difficult to decide whether that which is present should be termed Calyx or Corolla. If however it be of a delicate texture and coloured, it may be commonly considered the Corolla ; if coarse, and not coloured, (for botanists do not consider green to be a colour) the Calyx.

This is not given as a mode of discrimination to be relied upon in all cases ; but merely as a rule by which Botanists appear to be most generally governed.

Each STAMEN consists of two parts: the *Filament*, fig. 1, pl. 11, *a* and *Anther*. *b* The former supports the latter, which is of a membranous texture, filled with very minute powder or dust, called Pollen or Farina. *c*

The *Filament* is either

Capillary, hair-like, as in Plantain, (Plantago.)

Spiral, as in Bartsia.

Subulate, as in Viper's-bugloss, (Echium.)

Bearded, as in Mullein, (Verbascum.)

Forked, as in Self-heal, (Prunella) or

Plane, flat, as in Star-of-Bethlehem, (Ornithogalum.)

Unequal in Mezerion, (Daphne) and in ringent flowers.

Very long, as in Plantain; or

Very short, as in Arrow-grass, (Triglochin.)

In monopetalous flowers the Filaments are generally attached to the corolla, but sometimes are separate from it, as in Heath, (Erica )

In polypetalous flowers they are usually separate from the petals; but in Soap-wort and Corn-cockle every alternate filament is fastened to the claw of the petal, and in the Dog-rose, (Rosa canina) they are inserted in the calyx.

The *Anthers* are usually distinct from each other, but they are sometimes united, as in *Leontodon*, fig. 2.

To each filament there is generally one anther, but in *Mercury*, (*Mercurialis*) there are two to each filament, and in *Fumitory*, (*Fumaria*) there are three.

The form of an anther is either.

Globular, as in *Mercury*, fig. 3.

Arrow-shaped, as in *Crocus*, fig. 4.

Forked, as in *Vernal-grass*, (*Anthoxanthum*) fig. 5.

The situation of the Anther is not always on the summit of the filament. In *Herb-paris*, it is on the side; in *Arum* it grows from the receptacle without a filament; and in *Orchis* it is seated upon the pistil.

Although the Pollen appears to the naked eye a fine powder, yet the granules are, in different plants, variously formed. By microscopic investigation they have been discovered to be perforated in *Crane's-bill*, (*Geranium*;) wheel-shaped, in *Narcissus*; angular, in *Violet*; and resembling a rolled up leaf, in *Borage*, (*Borago*)

The PISTIL, when perfect, consists of three parts; the *Germen*, fig. 6, pl. 11. *a* the *Style*, *b* and the *Stigma*. *c*

The *Germen*, which is the rudiment of the seed vessel, is either

Superior, above the base of the calyx and corolla, as in Saint John's-wort, (*Hypericum*) fig. 7.

Inferior, below it, as in the Dog-rose, fig. 8.

The *Style*, with its stigma, usually falls off with the corolla, but in some cases remains attached to, and crowning, the seed vessel, as in Poppy, (*Papaver*) fig. 9.

In some flowers the style terminates in a mere point, without any expansion denoting a stigma, as in Campion, (*Lychnis*) fig. 10. In others the stigma is

Capitate, forming a round head, as in *Primula*, fig. 11.

Uncinate, hooked, as in *Viola*, fig. 12.

Plumose, feathery, as in the grasses, fig. 13.

Foliaceous, resembling a leaf, as in *Iris*, fig. 14.

Bifid, as in Dandelion, fig. 2. *a*

Trifid, in *Campanula*.

Tetrafid, in Willow-herb, (*Epilobium*) fig. 15.

The segments of the stigma are Revolute, rolled back, in *Leontodon*, fig. 2; *a* Convolute, rolled together, in *Crocus*.

Of the PERICARP, or Seed vessel, there are nine principal varieties :

1. The *Capsule*, a dry and hollow case, naturally dividing into several partitions on the ripening of the seeds. It is termed bivalved, when splitting into two parts, as in Pimpernel, (*Anagallis*) fig. 1, pl. 12; trivalved, splitting into three parts, as in Violet, fig. 2, &c.

The interior of the Capsule either consists of a single cavity, as in Mouse-ear-chickweed, (*Cerastium*) fig. 3, when it is termed unilocular; or is divided into cells or compartments, when it is called, according to the number of those cells, bilocular, trilocular, &c. figs. 4, 5, pl. 12. The dissepiments, or partitions which form the cells, are either parallel to the valves, as in Whitlow-grass, (*Draba*) fig. 6; or across, as in Shepherd's Purse, (*Thlaspi*) fig. 7.

2. The *Silique*, or pod, consisting of two valves with an internal partition, along both edges of which the seeds are alternately ranged, as in the Wall-flower, fig. 8.

3. The *Silicle*, a pouch, or less elongated pod, as Whitlow-grass, fig. 6, and Shepherd's-purse, fig. 7.
4. The *Legume*, a shell of two valves, without any dissepiment, or partition, having the seeds attached to one of its margins only, as the Pea, fig. 9.
5. The *Nut*, a hard shell, as the Hasel, fig. 1, *a* pl. 13.
6. The *Drupe*, a fleshy substance, enclosing a nut, to which it is closely attached, as the Cherry, fig. 2. *b*
7. The *Pome*, a fleshy substance like the Drupe, but containing a capsule of radiated cells, with several seeds, as the Apple, fig. 3.
8. The *Berry*, a fleshy substance without valves, containing one or more seeds enveloped with pulp, as the Gooseberry, where it is simple, fig. 4, *c* or Raspberry, where it is compound, fig. 5: the fruit consisting of several berries united together, each containing a seed.

9. The *Cone*, an enlarged and hardened state of the Catkin, page 9, fig. 2, pl. 6.

The Pericarp is not an essential part of the fructification, the seeds being frequently naked, and guarded only by the calyx, as in the Ground-ivy, (*Glechoma*) and all plants of the order to which that plant belongs, fig. 6, pl. 13.

The RECEPTACLE in its form is either,  
Plane, as in Yarrow, (*Achillea*)  
Convex, as in the Ox-eye.  
Oblong, as in the Water Crowfoot, fig. 1, pl. 14.  
Conical, as in the Daisy, (*Bellis*) figs. 2, 3.  
Extended and Club-shaped in Arum, fig. 4.

Its surface is

Naked in *Bellis*, fig. 3.  
Dotted in *Leontodon*, fig. 5.  
Cellular in the Cotton-thistle, (*Onopordum*) fig. 6.  
Chaffy, having chafflike substances growing from it, which separate the florets, as in Chamomile, (*Anthemis*.)

The SEEDS of plants assume all possible varieties of form. The number produced in each flower is equally various ; and plants are termed according to the number of the seeds formed in each flower, Monospermous, Dispermous, &c.

The two parts into which most seeds commonly separate, are termed Cotyledons. These afford nourishment to the embryo plant contained within them, and become seed leaves as it emerges from the earth, fig. 1, pl. 15.

Seeds are sometimes furnished with down, or a light feathery appendage, called a *pappus*, by means of which they are wafted through the air, and widely dispersed.

The down, or pappus, is either sitting, as in Sow-thistle, (*Sonchus*) fig. 2, in which it grows directly upon the seed ; or supported on a pedicle, as in Goat's-beard, (*Tragopogon*) fig. 3.

A seed is said to be *winged*, when it is furnished with a thin membrane, as in the Sycamore, (*Acer*) fig. 4, and Penny-cress, fig. 5.

The several parts of fructification having been considered, it may be useful to explain certain botanical terms which are applied to *flowers* of certain forms.

A Flower is said to be

Complete, when furnished with both Calyx and Corolla, fig. 1, pl. 16.

Incomplete, when destitute of the Corolla, as the Nettle, (*Urtica*) fig. 2.

Naked, when destitute of the Calyx, as Hyacinth, fig. 3.

Perfect, or united, when both the stamens and pistils are present, as Deadly night-shade, fig. 1, pl. 1.

Separate, when furnished with only one of those parts or organs of fructification.

Compound, when it consists of many florets seated on the same receptacle, and enclosed in one common calyx.

A compound flower is either Ligulate, all the florets ligulate, as in Succory, (*Cichorium*) fig. 4. *a*

Tubular, all the florets tubular, as the Thistle, fig. 5; *b* or

Radiate, the florets of the circumference expanded into rays, as in Ox-eye, fig. 6.

A flower is termed aggregate, when upon a common receptacle there are many florets, each elevated upon a peduncle or flower stalk, and having its proper calyx; anthers not adhering together, as Scabious, fig. 7.

It has been premised that all the seven parts of fructification are not invariably present in every flower. It must now be observed that the Stamens and Pistils are never wanting in any plant, the flowers of which are apparent; but that they *vary in their number*. In some flowers one Stamen only is found; in others two; in others three, and so forth; and so it is with the Pistils.

The Primary Linnean division of Vegetables into *Classes*, depends upon the number, position, and proportion of the *Stamens*.

The Classes are twenty-four.

The first eleven are characterised solely by the *number* of the Stamens, and are thus named:

- Class 1. *Monandria*, one stamen, fig. 1, pl. 17.
- 2. *Diandria*, two stamens, 2.
- 3. *Triandria*, three stamens, 3.
- 4. *Tetrandria*, four stamens, 4.

Class 5. *Pentandria*, five stamens, 5, pl. 17.  
 6. *Hexandria*, six stamens, 6.  
 7. *Heptandria*, seven stamens, 7.  
 8. *Octandria*, eight stamens, 8.  
 9. *Enneandria*, nine stamens, 9.  
 10. *Decandria*, ten stamens, 10.  
 11. *Dodecandria*, 12 to 19, 11.

The Twelfth and Thirteenth classes are distinguished by the *situation* of the stamens.

Class 12. *Icosandria*, twenty or more stamens inserted in the calyx, fig. 1, pl. 18.  
 13. *Polyandria*, twenty or more stamens inserted in the receptacle, fig. 2.

The Fourteenth and Fifteenth classes by the *number* and *proportion* of the stamens.

Class 14. *Didynamia*, four stamens, two long and two short, fig. 3, pl. 18.  
 15. *Tetradynamia*, six stamens, four long and two short, fig. 4.

The Sixteenth, Seventeenth, Eighteenth, and Nineteenth classes, by the *union* of the stamens with each other.

Class 16. *Monodelphia*, stamens all united by their filaments, fig. 5.

17. *Diadelphia*, stamens divided into two distinct sets, each set united by the filaments, fig. 6.

18. *Polyadelphia*, stamens divided into many sets, fig. 7.

19. *Syngenesia*, stamens united by the *anthers*, which in their union form a tube, the filaments being distinct; flowers compound, fig. 1, pl. 19.

The Twentieth class, *Gynandria*, by the stamens being inserted into the pistil, fig. 2.

The Twenty-first, Twenty-second, and Twenty-third classes, by the stamens and pistils being in separate flowers.

Class 21. *Monoecia*, stamens and pistils in separate flowers on the same plant, fig. 3.

22. *Dioecia*, stamens and pistils in separate flowers, on two distinct plants, fig. 4.

23. *Polygamia*, stamens and pistils united in some flowers and separate in others, on the same or on different plants.

The Twenty-fourth class, *Cryptogamia*, comprises all plants, the fructification of which is so obscurely formed, that no stamens are apparent.

## TABLE OF THE CLASSES.

|  | CLASS                     | EXAMPLE.  |
|--|---------------------------|---|
| Classes founded upon the number of the Stamens | 1.—Monandria,             | 1 Stamen, Mare's-tail, ( <i>Hippuris</i> )<br>pl. 17.   |
|  | 2.—Diandria,              | 2 Stamens, Enchanter's nightshade<br>( <i>Circæa</i> .)                                       |
|  | 3.—Triandria,             | 3 Valerian.   |
|  | 4.—Tetrandria,            | 4* Field-madder, ( <i>Sherardia</i> )   |
|  | 5.—Pentandria,            | 5 Centaury, ( <i>Chironia</i> .)  |
|  | 6.—Hexandria,             | 6† Rush, ( <i>Juncus</i> .)   |
|  | 7.—Heptandria,            | 7 <i>Trifoliate</i> .   |
|  | 8.—Octandria,             | 8 Willow-herb, ( <i>Epilobium</i> .)  |
|  | 9.—Enneandria,            | 9 Flowering-rush, ( <i>Butomus</i> .)   |
|  | 10.—Decandria,            | 10 Stitchwort, ( <i>Stellaria</i> .)  |
|  | 11.—Dodecadria, 12 to 19, | House-leek, ( <i>Semper-vivum</i> .)  |
| Number and Situation.                          | 12.—Icosandria,           | 20 or more stamens inserted in the<br>calyx: ex. Quince, ( <i>Pyrus Cydonia</i> .)<br>pl. 18. |
| Number and Proportion.                         | 13.—Polyandria,           | many stamens inserted in the<br>receptacle: ex. Marsh-mary-gold, ( <i>Caltha</i> .)           |
| Number and Proportion.                         | 14.—Didynamia,            | 4 stamens, 2 long and 2 short: ex.<br>Germander, ( <i>Teucrium</i> .)                         |
|  | 15.—Tetradynamia,         | 6 stamens, 4 long and 2 short: ex.<br>Radish, ( <i>Raphanus</i> .)                            |

\* Equal in length.

† Equal in length.

## TABLE OF THE CLASSES.

|                                       |   |
|---------------------------------------|---|
| Union of the Stamens with each other. | <b>CLASS</b><br>16.—Monadelphia, stamens all united by their <i>filaments</i> :<br>ex. Mallow, (Malva.)                                       |
|                                       | 17.—Diadelphia, stamens forming 2 sets: ex. Bitter-vetch, (Orobus.)   |
|                                       | 18.—Polyadelphia, stamens forming many sets: ex. Saint John's Wort, (Hypericum,)  |
|                                       | 19.—Syngenesia, stamens united by their <i>anthers</i> ; flowers compound; ex. Dandelion, (Leontodon.) pl. 19.                                |
| Union of the Stamens with the Pistil. | <b>20.—Gynandria,</b> stamens inserted into the pistil:<br>ex. Orchis.  |
| Separation of the Stamens.            | 21.—Monoecia, stamens and pistils in separate flowers on the same plant: ex. Sedge, (Carex)   |
|                                       | 22.— Dioecia, stamens and pistils in separate flowers on two distinct plants: ex. Red or white campion, (Lychnis dioica.)                     |
|                                       | 23.—Polygamia, stamens and pistils united in some flowers and separate in others, on the same or on different plants: ex. Orache, (Atriplex.) |
| Obscurity of the Stamens.             | <b>24.—Cryptogamia,</b> stamens indistinct; ex: Moss.   |

Each of the Linnean Classes is subdivided into certain *Orders*.

Those of the first thirteen Classes, depend upon the *number* of the *Pistils*.

Order 1. *Monogynia*, one Pistil, fig. 1, pl. 20 : ex.  
Honeysuckle, (*Lonicera*)

2. *Digynia*, two pistils, fig. 2 : ex. Grasses
3. *Trigynia*, three pistils, fig. 3 : ex.  
Stichwort, (*Stellaria*)
4. *Tetragynia*, four pistils, fig. 4 : ex.  
Moschatell, (*Adoxa*)
5. *Pentagynia*, five pistils, fig. 5 : ex.  
Wood-sorrel, (*Oxalis*)
6. *Hexagynia*, six pistils, fig. 6 : ex. Flowering-rush, (*Butomus*)
7. *Heptagynia*, seven pistils, fig. 7 : ex.  
Septas.
8. *Decagynia*, ten pistils, fig. 8 : ex. Phytolacca.
9. *Dodecagynia*, about twelve pistils, fig. 9.  
ex. House-leek, (*Semper-vivum*)
10. *Polygynia*, numerous pistils, fig. 10 : ex Ranunculus.

The two orders of the fourteenth class, (*Didynamia*) are founded upon the *absence* or *presence* of the *Pericarp*.

In the first order, *Gymnospermia*, the Pericarp is wanting, as in Wild-balm, (*Melittis*) fig. 1, pl. 21.

In the second, *Angiospermia*, it is present, as in Fox-glove, (*Digitalis*) fig. 2.

The two orders of the fifteenth class, (Tetradynamia) are distinguished by the *form* of the Pericarp.

In the first order, *Siliculosa*, the Pericarp is a Silicle, as in Shepherd's-purse, (*Thlaspi*) fig. 3.

In the second, *Siliquosa*, the Pericarp is a Silique, as in Hedge-mustard, (*Erysimum*) fig. 4.

The orders of the sixteenth and seventeenth classes, (Monodelphia and Diadelphia) are founded upon the *number* of the *stamens*, as *Triandria*, three stamens, *Pentandria*, five stamens, and so on.

The three orders of the eighteenth class, (Polyadelphia) are distinguished by the *number* and *situation* of the *stamens*.

In the first order, *Dodecandra*, there are twelve to twenty *stamens*, unconnected with the calyx.

In the second,      *Icosandria*, twenty or more stamens, their filaments inserted by sets in the calyx.

In the third,      *Polyandria*, the stamens are numerous, and unconnected with the calyx.

The five orders of the nineteenth class, (*Syngenesia*) are characterized by the *structure of the flowers*.

Order 1. *Polygamia æqualis*, every floret having stamens and pistils, as in Succory, (*Cichorium*) fig. 1, pl. 22.

2. *Polygamia superflua*, florets of the disk or centre, having stamens and pistils, those of the circumference furnished with a pistil only, as in the Daisy, (*Bellis*) fig. 2.

3. *Polygama frustranea*, florets of the disk having stamens and pistils, those of the circumference neither, as in Knapweed, (*Centaurea*) fig. 3.

4. *Polygamia necessaria*, florets of the disk with stamens only, those of the radius with a pistil only, as in Marygold.

5. *Polygamia segregata*, resembles Polygamia æqualis, except that each floret has its proper calyx, and all the florets collectively a common calyx, as in the Globe thistle, fig. 4.

The orders of the twentieth, twenty-first, and twenty-second classes, (*Gynandria*, *Monoecia*, and *Dioecia*) are almost entirely founded on the number of the *stamens*, as *Monandria*, one stamen, *Diandria*, two stamens, &c.

The three orders of the twenty-third class, (*Polygamia*) are founded upon the principle of the two preceding classes.

Order 1. *Monoecia*, flowers either united or separate on the same plant.

2. *Dioecia*, the different kinds of flowers on two different plants.
3. *Trioeccia*, the different kinds of flowers on three different plants.

The orders of the twenty-fourth class, (*Cryptogamia*) are

1. *Filices*, Ferns.
2. *Musci*, Mosses.
3. *Hepaticæ*, Liverworts.
4. *Algæ*, Sea weeds.
5. *Lychenes*, Lychens.
6. *Fungi*, Mushrooms.

**FIRST CLASS.—MONANDRIA.**

Stamen 1. Flowers united. Orders 2.

This class is but of small extent, having only two orders, *Monogynia* and *Dygynia*.

For the sake of more accurate arrangement, and readier reference, the several orders have been formed into subdivisions, according to certain characters in the fructification.

The order Monogynia, in this class, has two subdivisions, namely, *Gymnospermia*, seeds naked, and *Angiospermia*, seeds contained in a capsule. Samphire (Salicornia) and Mare's-tail, (Hippuris) are of the first subdivision; Chara of the second. Of the order Digynia, only one example has been discovered in Britain, viz. Star-wort, (Callitricha.)

**SECOND CLASS.—DIANDRIA.**

Stamens 2. Flowers united. Orders 3.

*Monogynia.*   *Dygynia.*   *Trigynia.*

1. *Monogynia* is subdivided thus :

<sup>a</sup> Flowers inferior, monopetalous, regular :

Ex. Privet, (*Ligustrum*.)

<sup>b</sup> Flowers inferior, monopetalous, irregular,  
seeds enclosed in a pericarp :

Ex. Speedwell, (*Veronica*) and Butter-wort, (*Pinguicula*.)

<sup>c</sup> Flowers inferior, monopetalous, irregular,  
seeds naked :

Ex. Water-horehound, (*Lycopus*) and Clary, (*Salvia*.) †

<sup>d</sup> Flowers superior : (page 17, pl. 11.)

Ex. Enchanter's-nightshade, (*Circaeæ*.)

<sup>e</sup> Flowers apetalous (without petals :)

Ex. Duck-weed, (*Lemna*.)

2. *Digynia*, consists only of the sweet-scented  
Vernal-grass, (*Anthoxanthum*.) ‡

3. *Trigynia*.<sup>o</sup>

† *Lycopus* and *Salvia* are the natural allies of the plants in Class *Didynamia*, but are separated from them on account of the number of their stamens.

‡ The grasses in general belong to the Class *Triandria*; but *Anthoxanthum* having only two stamens is separate from them.

<sup>o</sup> Of those orders to which an <sup>o</sup> is affixed, no instances occur in the British Flora.

## THIRD CLASS.—TRIANDRIA.

Stamens 3. Flowers united. Orders 3.

*Monogynia. Digynia. Trigynia.*

1. *Monogynia* is subdivided thus :

<sup>a</sup> Flowers superior :

Ex. Valerian, Crocus, and Iris.

<sup>b</sup> Flowers inferior, grass-like, seed one :\*

Ex. Club-rush, (*Scirpus*) and Cotton-grass, (*Eriophorum*.)

2. *Digynia* is an important order, comprehending most of the grasses :† the genera of this order are arranged or subdivided as follow :

<sup>a</sup> Calyx single-flowered :

Ex. Fox-tail grass, (*Alopecurus*.) Canary-grass, (*Phalaris*.)

<sup>b</sup> Calyx 2, or rarely 3-flowered :

Ex. Melic-grass, (*Melica*) Soft-grass, (*Holcus*.)

<sup>c</sup> Calyx 3, or, mostly many-flowered :

Ex. Meadow-grass, (*Poa*.) Quaking-grass, (*Briza*)

\* The plants of this division, excepting Mat-grass, (*Nardus*) form a part of the natural order *Cyperaceæ*.

† Which, together with the genus *Nardus*, and *Anthoxanthum* in the second class, belong to the natural order *Gramineæ*.

<sup>d</sup> Inflorescence spiked; flowers or spikelets inserted on all sides of a common stalk:

Ex. Barley, (*Hordeum.*) Wheat-grass, (*Triticum.*)

<sup>e</sup> Flowers in unilateral spikes:

Ex. Cord-grass, (*Spartina.*) Finger-grass, (*Digitaria.*)

### 3. *Trigynia*:

Ex. Blinks, (*Montia*) and Jagged-chickweed, (*Holosteum.*)

## FOURTH CLASS.—TETRANDRIA.

Stamens 4, of equal length. Flowers united.  
Orders 3.

*Monogynia. Digynia. Tetragynia.*

1. *Monogynia*; the indigenous plants of which order, are thus subdivided:

<sup>a</sup> Flowers monopetalous, one seeded, superior:

Ex. Teasel, (*Dipsacus*) and Scabious, (*Scabiosa.*)\*

<sup>b</sup> Flowers monopetalous, two-seeded, superior:

Ex. Bed-straw, (*Galium*) and Wild-madder, (*Rubia.*)†

\* All the plants under the first subdivision are of the natural order *Dipsaceæ*.

† In the second subdivision,—of the natural order *Rubiaceæ*.

<sup>c</sup> Flowers monopetalous, many-seeded, inferior :

Ex. Plaintain, (*Plantago*)

<sup>d</sup> Flowers tetrapetalous :

Ex. Cornel, (*Cornus*.)

<sup>e</sup> Flowers apetalous :

Ex. Pellitory-of-the-wall, (*Parietaria*) and Ladies'-mantle, (*Alchemilla*.)

2. *Digynia*; of which order Buffonia is the only English example.

3. *Tetragynia* :

Ex. Holly, (*Ilex*) and Pearl-wort, (*Sagina*.)

## FIFTH CLASS.—PENTANDRIA.

Stamens 5. Flowers united. Orders 7.

*Monogynia. Digynia. Trigynia. Tetragynia.*

*Pentagynia. Hexagynia. Polygynia.*

1. *Monogynia* is subdivided as follows :

<sup>a</sup> Flowers monopetalous, inferior, four naked seeds :

Ex. Comfrey, (*Symphytum*) and Scorpion-grass, (*Myosotis*.)

<sup>b</sup> Flowers monopetalous, inferior, seeds in a pericarp :

Ex. Pimpernel, (*Anagallis*) and Loose-strife, (*Lysimachia*.)

<sup>c</sup> Flowers monopetalous, superior :

Ex. Bell-flower, (*Campanula*) and Honeysuckle, (*Lonicera*)

<sup>d</sup> Flowers pentapetalous, inferior .

Ex. Spindle-tree, (*Euonymus*) and Violet, (*Viola*.)

<sup>e</sup> Flowers pentapetalous, superior :

Ex. Ivy, (*Hedera*.)

<sup>f</sup> Flowers incomplete :

Ex. Salt-weed, (*Glaux*) and Toad-flax, (*Thesium*.)

2. *Digynia* is subdivided thus :

<sup>g</sup> Flowers, monopetalous, inferior :

Ex. Gentian, (*Gentiana*) and Dodder, (*Cuscuta*.)

<sup>h</sup> Flowers incomplete :

Ex. Salt-wort, (*Salsola*) and <sup>i</sup>Goose-foot, (*Chenopodium*.)

<sup>i</sup> Flowers pentapetalous, superior, two seeded, umbelliferous.\* Of this subdivision there are three compartments, viz.

Involucres, universal and partial :

Ex. Carrot, (*Daucus*) and Angelica.

\* Natural order, *Umbelliferae*.

Involucres partial only :

Ex. Fool's-parsley, (*Aethusa*) and Chervil, (*Scandix*.)

Involucres, none :

Ex. Celery, (*Apium*) and Parsnip, (*Pastinaca.*)

3. *Trigynia*. This order is thus subdivided :

<sup>a</sup> Flowers superior :

Ex. Guelder-rose, (*Viburnum*) and Elder, (*Sambucus.*)

<sup>b</sup> Flowers inferior :

Ex. Tamarisk, (*Tamarix*) and Strap-wort, (*Corrigiola.*)

4. *Tetragynia* has but one British plant, Grass of Parnassus, (*Parnassia.*)

5. *Pentagynia* three, Sea-lavender, (*Statice*) Flax, (*Linum*) and Sibbaldia.

6. *Hexagynia*, Sun-dew, (*Drosera.*)

7. *Polygynia*, Mouse-tail, (*Myosurus.*)

## SIXTH CLASS.—HEXANDRIA.

Stamens 6, of equal length. Flowers united.  
Orders 6.

*Monogynia. Digynia. Trigynia. Tetrapterygynia.*  
*Hexagynia. Polygynia.*

1. *Monogynia* is subdivided thus :

<sup>a</sup> Flowers furnished with a regular calyx and  
with a corolla :

Ex. Barberry, (Berberis.)

<sup>b</sup> Flowers with a sheath :

Ex. Snow-drop, (Galanthus) and Narcissus.

<sup>c</sup> Flowers destitute of a calyx, but furnished  
with a corolla :\*

Ex. Solomon's Seal, (Convallaria) and Hyacinth.

<sup>d</sup> Flowers furnished with a calyx, but destitute  
of a corolla :

Ex. Rush, (Juncus.)

2. *Digynia* : ex. Mountain-sorrel, (Oxyria.)

3. *Trigynia* : ex. Dock, (Rumex.)

4. *Tetrapterygynia*.<sup>0</sup>

\* The greater part of the plants in this third subdivision are of the natural order *Liliaceæ*. All in the fourth, of the natural order *Junceæ*.

5. *Hexagynia* : ex. Star-fruit.
6. *Polygynia* : ex. Water-plantain, (*Alisma*.)

## SEVENTH CLASS.—HEPTANDRIA.

Stamens 7. Flowers united. Orders 4.

*Monogynia. Digynia. Tetragnia. Heptagynia.*

1. *Monogynia* : ex. *Trientalis*.
2. *Digynia*.<sup>0</sup>
3. *Trigynia*.<sup>0</sup>
4. *Heptagynia*.<sup>0</sup>

## EIGHTH CLASS.—OCTANDRIA.

Stamens 8. Flowers united. Orders 4.

*Monogynia. Digynia. Trigynia. Tetragnia.*

1 *Monogynia* is subdivided thus :

“Flowers complete :

Ex. Maple, (*Acer*) and Willow-herb, (*Epilobium*)

<sup>b</sup>Flowers incomplete:

Ex. Mezereon, (Daphne.)

2. *Digynia*.<sup>0</sup>

3. *Trigynia*: ex. Persicaria, (Polygonum.)

4. *Tetragynia*, Moschatell, (Adoxa) and Herb-paris, (Paris.)

#### NINTH CLASS.—ENNEANDRIA.

Stamens 9. Flowers united. Orders 3.

*Monogynia. Digynia. Hexagynia.*

1. *Monogynia*.<sup>0</sup>

2. *Digynia*.<sup>0</sup>

3. *Hexagynia*: ex. Flowering-rush, (Butomus.)\*

#### TENTH CLASS.—DECANDRIA.

Stamens 10. Flowers united. Orders 5.

*Monogynia. Digynia. Trigynia. Pentagynia.  
Decagynia.*

\* Natural Order, *Butomeæ*.

1. *Monogynia* is subdivided thus :

<sup>a</sup>Corolla polypetalous :

Ex. Winter-green, (Pyrola.)

<sup>b</sup>Corolla monopetalous, equal :

Ex. Andromeda and Arbutus.

2. *Digynia*: ex. Golden Saxifrage, (Chrysosplenium and Soap-wort, (Saponaria.)

3. *Trigynia*: ex. Stitch-wort, (Stellaria) and Catch-fly, (Silene.)

4. *Pentagynia*: ex. Wood Sorrel, (Oxalis) and Cockle, (Agrostemma.)

5. *Decagynia*.<sup>9</sup>

## ELEVENTH CLASS.—DODECANDRIA.

Stamens 12 to 19. Flowers united. Orders 6.

*Monogynia*. *Digynia*. *Trigynia*. *Tetragynia*.  
*Pentagynia*. *Dodecagynia*.

1. *Mongynia*: ex. Lythrum.

2. *Digynia*: ex. Agrimony, (Agrimonia.)

3. *Trigynia*: Mignonette, (Reseda.)
4. *Tetragynia*.<sup>0</sup>
5. *Pentagynia*.<sup>0</sup>
6. *Dodecagynia* is exemplified in the House-leek,  
(*Sempervivum*.)

#### TWELFTH CLASS.—ICOSANDRIA.

Stamens 20 or more, proceeding from the Calyx.  
Flowers united. Orders 5.\*

*Monogynia. Digynia. Trigynia. Pentagynia.*  
*Polygynia.*

1. *Monygynia*: ex. Cherry, (*Prunus*.)
2. *Digynia*: ex. Hawthorn, (*Cratægus*.)
3. *Trigynia*: ex. Mountain-ash, (*Sorbus*.)
4. *Pentagynia*: ex. Spiræa.
5. *Polygynia*: ex. Bramble, (*Rubus*) Strawberry,  
(*Fragaria*) and Avens, (*Geum*.)

\* All the plants in this class belong to the natural order *Rosaceæ*.

## THIRTEENTH CLASS.—POLYANDRIA.

Stamens numerous, proceeding from the receptacle. Flowers united. Orders 7.

*Monogynia. Digynia. Trigynia. Tetragynia.  
Pentagynia. Hexagynia. Polygynia.*

1. *Monogynia* is subdivided thus :

<sup>a</sup>Corolla tetrapetalous :

Ex. Poppy, (Papaver) and Celandine, (Chelidonium).\*

<sup>b</sup>Corolla pentapetalous :

Ex. Cistus, and Lime-tree, (Tilia.)

<sup>c</sup>Corolla polypetalous :

Ex. Water-lily, (Nymphaea) and Nuphar.†

2. *Digynia.* <sup>0</sup>

3. *Trigynia* : ex. Pæony and Larkspur, (Delphinium.)

4. *Tetragynia.* <sup>0</sup>

5. *Pentagynia* : ex. Columbine, (Aquilegia.)

\* Natural order *Papaveraceæ.*

† Both of the natural order *Nymphaeæ.*

6. *Hexagynia*: ex. Water-soldier, or Aloe, (Stratiotes.)

7. *Polygynia*: ex. Crow-foot, (Ranunculus) and Marsh-marygold, (Caltha.)\*

#### FOURTEENTH CLASS.—DIDYNAMIA.

Stamens 4, two long and two short. Flowers united. Corolla ringent or personate. Orders 2.

*Gymnospermia*: seeds naked. *Angiospermia*: seeds enclosed in a distinct capsule.

1. *Gymnospermia* is subdivided thus :

Calyx commonly five cleft :

Ex. Dead-nettle, (Lamium) and Wound-wort, (Stachys.)

Calyx two-lipped :

Ex. Thyme, (Thymus) and Wild Balm, (Melittis.)†

\* The genera of this artificial, constitute the natural order *Ranunculaceæ*.

† A new arrangement of the genera in this order, all of which are of the natural order *Labiatæ*, appears in Hooker's second edition of the British Flora.

2. *Angiospermia* is subdivided thus :

<sup>a</sup>Calyx four cleft :

Ex. Yellow-rattle, (*Rhinanthus*) and Cow-wheat,  
(*Melampyrum*.)

<sup>b</sup>Calyx five cleft :

Ex. Fox-glove, (*Digitalis*.)

<sup>c</sup>Calyx two-leaved :

Ex. Broom-rape, (*Orobanche*)

## FIFTEENTH CLASS.—TETRADYNAZIA.

Stamens 6, four long and two short. Flowers united. Corolla tetrapetalous, cruciform.\* Orders 2.

*Siliculosa*: fruit a short pod or pouch. *Siliquosa*: fruit a long and narrow pod.

1. *Siliculosa* is subdivided thus :

<sup>a</sup>Silicles without valves :

Ex. Sea-rocket, (*Cacile*) and Whart-cress, (*Coronopus*.)

\* Natural order *Cruciferæ*.

<sup>b</sup>Silicles two-valved, entire or nearly so :

Ex. Whitlow-grass, (Draba) and Scurvy-grass, (Cochlearia.)

<sup>c</sup>Silicles two-valved, emarginate, notched :

Ex. Candy-tuft, (Iberis) and Thlaspi.

2. *Siliquosa* is subdivided thus :

<sup>a</sup>Calyx closed :

Ex. Wall-cress, (Arabis) and Wall-flower, (Chiranthus.)

<sup>b</sup>Calyx spreading :\*

Ex. Water-cress, (Sisymbrium) and Mustard, (Sinapis.)

## SIXTEENTH CLASS.—MONODELPHIA.

Stamens united by their filaments in one set.  
Flowers united. Corolla pentapetalous. Orders 8.

\* In Smith's English Flora, the arrangement of the order *Siliquosa* is according to certain characters in the seeds.

1st.—Cotyledons accumbent (0=) the radicle lateral, and applied to the two edges of the seed lobes.

2nd.—Cotyledons incumbent (0||) the radicle originating from the back of, and applied to, one of the lobes.

*Triandria.* *Pentandria.* *Heptandria.* *Octandria.* *Decandria.* *Endecandria.* *Dodecandria.* *Polyandria.*

1. *Triandria.*<sup>0</sup>
2. *Pentandria*: ex. Stork's-bill, (Erodium.)
3. *Heptandria.*<sup>0</sup>
4. *Octandria.*<sup>0</sup>
5. *Decandria*: ex. Crane's-bill, (Geranium.)\*
6. *Endecandria.*<sup>0</sup>
7. *Dodecandria.*<sup>0</sup>
8. *Polyandria*: ex. Mallow, (Malva) Marsh-mallow, (Althæa) and Lavatera.†

#### SEVENTEENTH CLASS.—DIADEPHIA.

Filaments combined in two sets. Flowers united. Orders 4.

\* Natural order *Geraniaceæ*.

† Natural order *Malvaceæ*.

*Pentandria. Hexandria. Octandria. Decandria.*

1. *Pentandria*.<sup>0</sup>

2. *Hexandria*: ex. Fumitory, (Fumaria,) and Corydalis.\*

3. *Octandria*: ex. Milk-wort, (Polygala.)†

4. *Decandria*: Flowers papilionaceous; fruit a legume;‡ subdivided thus:

<sup>a</sup>Stamens all connected or monodelphous; tube frequently cleft above:

Ex. Broom, (Spartium) and Furze, (Ulex.)

<sup>b</sup>Stamens diadelphous, that is, nine filaments united and forming a membrane, which surrounds the germ, the tenth distinct; stigma pubescent:

Ex. Bitter-vetch, (Orobus) and Vetch, (Vicia.)

<sup>c</sup>Pod two-celled:

Ex. Milk-vetch, (Astragalus.)

\* Natural order *Fumariaceæ*.

† Natural order *Polygalaceæ*.

‡ Constituting the natural order *Leguminosæ*.

*a* Pod generally one-seeded :

Ex. Trefoil, (*Trifolium*.)

*e* Pod somewhat jointed :

Ex. Saintfoin, (*Hedysarum*) and Bird's-foot, (*Ornithopus*.)

*f* Pod one-celled, many-seeded :

Ex. Bird's-foot Trefoil, (*Lotus*.)

## EIGHTEENTH CLASS.—POLYADELPHIA.

Stamens combined in more than two sets.  
Flowers united. Orders 3.

*Dodecandria. Icosandria. Polyandria.*

1. *Dodecandria.* <sup>0</sup>

2. *Icosandria.* <sup>0</sup>

3. *Polyandria:* ex. Saint John's-wort, (*Hypericum*)\*

\* Natural Order *Hypericinæ*.

## NINETEENTH CLASS.—SYNGENESIA.\*

Stamens united by their anthers, which form a tube, their filaments separate. Flowers compound. Orders 5.

*Polygamia Aequalis.* *Polygamia Superflua.*  
*Polygamia Frustranea.* *Polygamia Necessaria.*  
*Polygamia Segregata.*

1. *Polygamia Aequalis* has three subdivisions :

<sup>a</sup>Florets all ligulate :

Ex. Succory, (Cichorium) and Dandelion, (Leontodon.)

<sup>b</sup>Florets tubular, Flowers somewhat globular :

Ex. Thistle, (Carduus.)

<sup>c</sup>Florets tubular, erect, crowded ; Flowers nearly level at the top :

Ex. Hemp-agrimony, (Eupatorium.)

2. *Polygamia Superflua*, is subdivided thus :

Florets of the radius or margin, obsolete or wanting.

Ex. Tansy, (Tanacetum.)

\* "This is an extensive and most natural class, corresponding with the Composite of the natural arrangement."—HOOKER.

Florets of the radius or circumference ligulate, forming spreading rays.

Ex. Daisy, (*Bellis*) and Aster.

3. *Polygamia Frustranea* : ex. Knap-weed, (*Centaurea*.)

4. *Polygamia Necessaria*.<sup>0</sup>

5. *Polygamia Segregata*.<sup>0</sup>

## TWENTIETH CLASS.—GYNANDRIA.

Stamens attached to the Style, above the Germen. Orders 7. Those which contain indigenous plants are,

*Monandria. Diandria. Hexandria.*

1. *Monandria* has four subdivisions :

<sup>a</sup>Anther of two distinct vertical cells, fixed to the top of the column :

Ex. Orchis and Ophrys.

<sup>b</sup>Anther parallel with the stigma :

Ex. Ladies'-traces, (*Neottia*.)

<sup>c</sup>Anther terminal, persistent:

Ex. Helleborine, (*Epipactus*.)

<sup>d</sup>Anther terminal, deciduous:

Ex. Tender Tway-blade, (*Malaxis*).\*

2. *Diandria*: ex. Ladies'-slipper, (*Cypripedium*.)

3. *Hexandria*: ex. Birth-wort, (*Aristolochia*).†

## TWENTY-FIRST CLASS.—MONOECIA.

Plants androgynous, that is, Stamens and Pistils in separate flowers upon the same plant.  
Orders 9.

The first seven are distinguished by the number of the stamens, as *Monandria*, *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Polyandria*. The eighth and ninth by the number of sets into which the stamens are formed, as *Monodelphia* and *Polyadelphia*.

1. *Monandria*: ex. Horned Pond-weed, (*Zannichellia*)

\* All the plants of this and the second order, belong to the natural order *Orchideæ*.

† Natural order *Aristolochieæ*.

2. *Diandria.*<sup>0</sup>
3. *Triandria*: ex. Reed-mace, (*Typha*) and Sedge, (*Carex*.)
4. *Tetrandia*: ex. Box, (*Buxus*) and Nettle, (*Urtica*.)
5. *Pentandria*: ex. Bryony, (*Bryonia*.)
6. *Hexandria*: ex. Pipewort, (*Eriocaulon*.)
7. *Polyandria*: ex. Water Milfoil, (*Myriophillum*) Burnet, (*Poterium*) together with the amen-taceous plants, Oak, (*Quercus*) Beech, (*Fagus*) and Hasel, (*Corylus*.) Arum is brought hither from the twentieth class, the flowers being simply monoecious.
8. *Monodelphia*: ex. Fir, (*Pinus*.)
9. *Polyadelphia.*<sup>0</sup>

## TWENTY-SECOND CLASS.—DIOECIA.

Stamens and Pistils in separate flowers on two distinct plants. Orders 9, distinguished by the same characters as those of the preceding class.

*Monandria.* *Diandria.* *Triandria.* *Tetrandria.* *Pentandria.* *Hexandria.* *Octandria.* *Enneandria.* *Monodelphia.*

1. *Monandria.*<sup>0</sup>
2. *Diandria:* ex. Willow, (*Salix.*)\*
3. *Triandria:* ex. Butcher's-Broom, (*Ruscus.*)
4. *Tetrandria:* ex. Mistletoe, (*Viscum*)
5. *Pentandria:* ex. Hop, (*Humulus.*)
6. *Hexandria:* ex. Black Bryony, (*Tamus.*)
7. *Octandria:* ex. Poplar, (*Populus.*)
8. *Enneandria:* ex. Mercury, (*Mercurialis.*)
9. *Monodelphia:* ex. Juniper, (*Juniperus*) and Yew, (*Taxus.*)

### TWENTY-THIRD CLASS.—POLYGAMIA.

Stamens and Pistils united in some flowers and separate in others, on the same or on different plants, and having two different kinds of Perianth. Orders 3.

\* Natural order *Amentaceæ.*

*Monoecia.*   *Dioecia.*   *Trioecea.*

1. *Monoecia* : ex. Orache, (Atriplex.)
2. *Dioecia.*<sup>0</sup>
3. *Trioecea.*<sup>0</sup>

## TWENTY-FOURTH CLASS.—CRYPTOGAMIA.

Stamens and Pistils not visible. Orders 6.

The intricacies of this Class are so formidable, that it would be unavailing, in an elementary work, to attempt the illustration of its orders.\*

\* For the most perfect arrangement of the orders in this class, the student is referred to Hooker's second edition of the "British Flora."

## GENERA, &amp;c.

It has been shewn that the primary Linnean division of Vegetables, into *Classes*, depends mainly upon the number of the Stamens; and the secondary division, into *Orders*, chiefly upon the number of the Pistils; certain other conformations being also subservient to the arrangement.

The next division, namely, that of the Orders into GENERA, depends also upon the fructification, all parts of which, in their various forms, are considered.

For example: a plant in which *ten stamens* appear, belongs obviously to the class Decandria, fig. 10, pl. 17: but that class consists of five orders. If, therefore, the plant have *three pistils*, it is by that character referred to the order Trigynia, fig. 3, pl. 20: but that order contains *several genera*, characterised (in those of which native examples are afforded us) chiefly by the number and form of the petals, and the form of their seed vessels. If, therefore, the plant in question be furnished with a capsule of one cell, opening with six valves, containing many seeds, and with five deeply divided expanded petals, fig. 3, pl. 20, that plant is *Stellaria*, or *Stitchwort*. These characters

are peculiar to plants of the genus *Stellaria*. They are sufficient to identify it, and being all that are *essential* to that purpose, are called its *essential characters*.

A full description of every part of the fructification is, however, frequently afforded by Botanists, to facilitate the determination of the Genera; for although in most cases the Essential Character would, to an experienced eye, be sufficient, yet it sometimes happens that the minute differences by which certain genera are distinguished, are so difficult to detect, that, without the assistance of ample description, the less experienced Botanist would be liable to doubts and mistakes.

The full description, or, as it is termed, the natural character of the genera, is given by Sir E. SMITH, in his "English Flora." And the most correct Essential Character, by Professor HOOKER, in his second edition of the "British Flora."

The last Linnean division remains to be considered; namely, the SPECIES of Plants.

The Classes, Orders, and Genera, having been described as taking their peculiar characters exclusively from the fructification, it must now

be observed of the Species, that although they also are in some instances distinguished by the fructification, yet that they are more commonly characterised by the Root, the Stem, the Leaves, the mode of flowering, and appendages of the plant.

For example: having ascertained a plant as belonging to the genus *Stellaria*, or Stitchwort, we desire to know what *Species* or what *kind* of Stitchwort it should be called. We proceed, therefore, to a farther examination of its structure; and if we find that it has a trailing stem, flowers upon subdivided stalks, leaves broad, spear-shaped, callous at the point, and smooth-edged, and a calyx longer than the petals, we are satisfied that it can be no other than that species which is termed “*Uliginosa*,” or bog Stitchwort, pl. 23.

The organs of fructification, in their various forms having been considered, with reference to the Classes, Orders, and Genera, the other parts of a plant must now be illustrated.

First the Root, of which there are various kinds:

1. *Fibrous*, the most simple of all roots, composed of fibres only, as in most of the grasses, fig. 1, pl. 24.

2. *Creeping*, (repens) spreading horizontally and throwing out little roots from space to space, extremely tenacious of life ; as in Mint and Couch-grass, fig. 2.
3. *Fusiform*, or spindle-shaped, like the Carrot, fig. 3.
4. *Abrupt*, or premorse, as Devil's-bit, (*Scabiosa succisa*) fig. 4.
5. *Roundish*, as the turnip, fig. 5.
6. *Tuberous*, consisting of roundish knobs, connected by fibres, as the Potatoe, fig. 1, pl. 25.
7. *Bulbous*, as in the Tulip, in which it is solid, fig. 2 ; in the Onion, in which it is tunicated, fig. 3 ; the Lily, in which it is scaly, fig. 4.
8. *Granulated*, as in Wood-sorrel, fig. 5.
9. *Fascicled*, fig. 6.
10. *Palmate* and *Twin*, as in Orchis, figs. 7, 8.
11. *Dentate*, as in Primula, fig. 9.

Roots are either Annual, Biennial, or Perennial.

Annual, when they belong to such plants as are produced and bear flowers and seeds within the year.

Biennial, when they belong to such plants as produce leaves only the first year, and flowers and seeds the next, and then perish.

Perennial, flowering through many successive years, to an indefinite period.

The STEM, (Caulis) elevates the leaves and fructification ; it is either

Woody or herbaceous.

Branched or simple.

Leafy, fig. 1, pl. 26, or  
Scaly, fig. 2.

A Stem is said to be

Dichotomous, or forked, when regularly and repeatedly divided, as the Mistletoe, (*Viscum*) fig. 3.

Alternately branched, when its branches are alternate.

The branches are said to be

Two ranked or distichous, when they are spread in two opposite directions.

Four ranked, when they spread in four directions,  
crossing each other alternately in pairs.

Verticilled or whorled, when many surround the  
stem at the joints.

Diverging, when at right angles with the stem.

Divaricated, when at an obtuse angle.

Deflexed, inclining downwards in an arch.

Reflexed, hanging perpendicularly.

### A Stem is termed

Procumbent or trailing, when it is weak and lies  
upon the ground, as the Wood-loosestrife, and  
Bog-stitchwort.

Creeping, when lying on the earth and striking  
root at the joints, as the Creeping Crow-foot,  
(*Ranunculus repens*) fig. 4, pl. 26.

Ascending, lying partly on the ground and then  
standing erect.

Prostrate or depressed, lying flat and spreading  
horizontally over the ground, as Swine's-cress,  
(*Coronopus*.)

Reclining, curved towards the ground, as the  
Bramble, (*Rubus*.)

Climbing, supporting itself by spiral tendrils, as  
the Vine; or by fibres, as the Ivy; or entwining  
round other plants either from left to right, as  
Climbing Buckwheat, (*Polygonum convolvulus*) fig. 1. pl. 27; or from right to left, as  
Great Bindweed, (*Convolvulus sepium*) fig. 2.

Straight, as in the different species of the Lily.  
Diffuse, or loosely spreading, as Sea Rocket,  
(*Cakile*.)

Zigzag or flexuose, forming angles alternately  
from right to left, and from left to right, as  
*Cardamine flexuosa*.

Stems are either

Cylindrical, as in *Trollius*.  
Two-edged, as in *Lathyrus*.  
Triangular, as in some Rushes.  
Square, as in Dead-nettle.  
Angular, with five or more angles.  
Winged, the angles extended into flat leafy  
borders, as the Everlasting-pea, (*Lathyrus*  
*latifolius*.)

The surface of the stem is either

Smooth, (glabrous.)  
Viscid.  
Warty.  
Rough, with rigid irregularities, (scabrous.)  
Bristly, (hispid.)  
Hairy, (pilose.)  
Downy, (tomentose.)  
Shaggy, (villose.)  
Woolly.

Glaucous, clothed with a fine sea green meali-  
ness, which easily rubs off, as in Couch-grass,  
(*Triticum repens.*)

Striated, marked with fine parallel lines.

Sulcated, or deeply grooved.

Muricated, sprinkled with awl-shaped points.

Thorny or spinous, armed with spines.

Plants destitute of a stem are termed acaulis,  
or stemless, as the Dwarf-thistle, (*Carduus acaulis.*)

In addition to the Stem, (*Caulis*) Linneus  
enumerates six other species of Trunk or Stalk.

1. The *Straw* or Culm, the peculiar stem of Grasses,  
Rushes, and plants nearly allied to them.

It is either

Jointed, as in the Grasses, fig. 3, pl. 27; or  
Without joints, as in the Rush.

2. The *Scape*, or stalk, proceeding immediately  
from the root, and elevating the fructification  
only, as in Primula, fig. 4, pl. 27. Dandelion,  
Daisy, Hyacinth, and Narcissus.

3. The *Flower-stalk*, or peduncle, issues from the  
stem, and supports the flower and fruit,  
fig. 2.<sup>a</sup> A partial flower-stalk, or pedicel, is  
the ultimate subdivision of a peduncle, as  
in the Cowslip, and Bog-stitchwort, pl. 23.

If the flower-stalk terminates the stem, it is said to be terminal.

If it is situated at the side, lateral.

If it grows from between the stem and a branch, or between the stem and a leaf, axillary, pl. 23, <sup>a</sup>.

Proceeding from a leaf-bud, gemmaceous.

Clustered or aggregate, when several grow together.

Scattered, numerous, and without order.

When there is no flower-stalk, the flowers are termed sessile or sitting, as in Dodder, (*Cuscuta*.)

4. The *Leaf-stalk*, or petiole, arises from the stem or branch, and supports the leaves, fig. 2, pl. 27, <sup>a</sup>; it is generally of a green colour; sometimes flat or hollow on the upper side, round and convex on the under; simple or compound, and sometimes dilated at the base, as in Wild Angelica, (*Angelica sylvestris*) and sometimes ending in a tendril, as in White climbing Fumitory, (*Fumaria clavicularis*.)
5. The *Frond* is an union of stem and leaf, bearing the fructification of Ferns, Sea-weeds, and Lichens, fig. 5.
6. The *Stipe* is the stem of mushrooms, fig. 7, pl. 2: the term is also used to denote the slender thread connecting the appendage with which some seeds of compound flowers are

furnished, as in Goat's-beard, page 21; fig. 3, pl. 15.

The LEAVES of plants are so important in furnishing specific characters, that great attention must be paid to their forms, texture, and situation.

They are said to be

Seed leaves, when they proceed immediately from the seed, fig. 1, pl. 28.

Radical, when springing from the root, fig. 4, pl. 27.

Cauline, when growing on the stem, fig. 2, pl. 27.

Branch leaves, when on the branches.

Axillary, proceeding from between the branch and stem.

Floral, when near the flower, fig. 2, <sup>c</sup> pl. 27.

The form of a leaf is either *simple*, as in Grasses, Orchises, and Lilies; or *compound*, as in most umbelliferous plants, such as Parsley, Hemlock, &c.

Simple leaves are either entire, (undivided) as those of Grasses; or lobed, as those of the Thistle.

A *simple leaf* is either

Orbicular, fig. 2, pl. 28.

Subrotund, roundish, fig. 3.

Ovate, egg-shaped, fig. 4.

Obovate, of the same figure, but with the narrower end next the stem.

Oval, or elliptical, fig. 5.

Oblong, three or four times longer than broad, fig. 6.

Lanceolate, fig. 7.

Linear, or strap-shaped, fig. 8.

Subulate, awl-shaped, fig. 9.

Acerose, linear, acute, rigid, and evergreen, as in the Fir, fig. 2, pl. 6.

Triangular, or Deltoid, fig. 10, pl. 28.

Quadrangular.

Quinquangular.

Rhomboid, fig. 11.

Reniform, kidney-shaped, fig. 1

Cordate, heart-shaped, fig. 13. 2.

Spatulate, battledore-shaped, fig. 14.

Wedge-shaped, fig. 15.

Sagittate, arrow-shaped, fig. 16.

Hastate, halbert-shaped, fig. 17.

Fiddle-shaped, fig. 18.

Runcinate, fig. 19.

Lyrate, lyre-shaped, fig. 20.

Fissum, divided, parted about half-way down, with straight margins, fig. 21.

A simple leaf is said to be bilobed, fig. 21, trilobed, &c. according to the number of divisions, figs. 1, 2, pl. 29.

Sinuated, when the divisions are hollow and wide, fig. 3.

- Partite, when they are very deep, fig. 4.
- Laciniated, when the leaf is irregularly cut, fig. 5.
- Palmate, hand-shaped, fig. 6.
- Pinnatifid, fig. 7.
- Oblique, when the two halves are unequal, as in the Elm, fig. 8.

A *compound leaf* consists of many leaflets attached to a common petiole, or leaf stalk.

It is either

- Binate, of two leaflets, fig. 1, pl. 30.
- Ternate, of three, fig. 2.
- Digitate, of five, fig. 3.
- Pedate, foot-shaped, fig. 4.
- Pinnated, winged, with a terminal leaflet, fig. 5.
- Abruptly pinnated, fig. 6.
- Alternately pinnated, fig. 5.
- Oppositely pinnated, fig. 6.
- Pinnated in a lyrate manner, fig. 7.
- Pinnated interruptedly, fig. 8.
- Pinnated decursively, fig. 9.
- Biternate, fig. 10. Here the common leaf-stalk is divided into three parts, each of which has three leaflets.
- Triternate, fig. 11.

Bipinnate, fig. 12.

Tripinnate, fig. 13.

A common leaf-stalk is frequently mistaken for a branch. The two surfaces, however, of a leaf-stalk, viz. a front, which is either flat or hollow, and a back, which is mostly convex, will always distinguish it from the branch, which is alike on both sides.

A leaf is termed

Obtuse, when it terminates obtusely, fig. 9,  
pl. 29.

Acute, fig. 10.

Acuminate, fig. 11.

Emarginate, fig. 12.

Retuse, fig. 13.

The margin of a leaf is either

Entire.

Ciliated, fringed with soft hairs.

Serrated, edged with sharp teeth, like those of a saw, pointing towards the extremity of the leaf, fig. 1, pl. 31.

Doubly serrated, fig. 2.

Crenate, fig. 3.

Spinous, beset with thorns, as in the Holly, fig. 4; or prickles, as in the Butcher's-broom, (*Ruscus Aculeatus*.)

Glandular, fringed with glands.

Plicate, plaited, fig. 5.

Curled, fig. 6.

Leaves are said to be veined, when the vessels by which they are nourished, are branched and subdivided, fig. 7.

Ribbed, or nerved, when the vessels or petiole extend in simple lines from the base to the point, fig. 8.

With respect to their texture, leaves are said to be

Fleshy, when of a thick pulpy substance.

Gibbous, swelling on one side or both, from excessive pulp.

Channelled, or furrowed.

Keeled, bent in the form of a boat.

Membranous.

Two-edged.

Sword-shaped.

They are, in their arrangement, either

Opposite, fig. 9.

Alternate, fig. 10.

Scattered.

Crowded.

Verticillate, whorled; or Stellate, starred, fig. 11. <sup>a b</sup>

Imbricated, fig. 12.

Tufted, or bundled, fig. 13.

- Decussated, crossing each other in pairs, fig. 14.
- Distichous, two-rowed, fig. 15.
- Close, pressed to the stem.
- Inflexed, fig. 1, pl. 32.
- Erect, fig. 2.
- Patent, or spreading, fig. 3.
- Horizontal, fig. 4.
- Reflexed, fig. 5.
- Revolute, the summit rolled backwards, fig. 6.

With respect to the mode in which leaves are connected to the plant, they are said to be

- Petioled, when on a foot stalk, fig. 7.
- Sessile, when there is no foot stalk, fig. 8.
- Amplexicaule, when embracing the stem, fig. 9.
- Decurrent, running down the stem, fig. 10.
- Sheathing, fig. 11.
- Connate, when opposite and sessile, and united at their base, fig. 12.
- Perforated, the stem running through the leaf, fig. 13.
- Peltate, the leaf-stalk inserted into the disk of the leaf, fig. 14.
- Equitant, compressed and embracing each other at the base, fig. 15.

Leaves are either Evergreen, permanent through one, two, or more winters, so that the branches are never naked, as in the Ivy ; or

Deciduous, falling off at the approach of winter,  
as in most European trees and shrubs.

The INFLORESCENCE, or mode of flowering, affords another important character in defining the Species of plants.

The different modes of flowering are distinguished thus :

1. A *Whorl*; flowers disposed in a circle round the stem, as in Common Water Violet, (*Hottonia palustris*) fig. 1, pl. 33. Dead-nettle, and Ground Ivy.
2. A *Cluster*, or Raceme, consists of numerous rather distant flowers, arranged along a common stalk, each on its own proper peduncle, as in the Currant and Barberry trees, fig. 2, Scorpion-grass and Enchanter's nightshade.
3. A *Spike* bears numerous flowers, ranged alternately on a common stalk, most commonly without a peduncle, as *Veronica spicata*, *Plaintain*, and some of the grasses, figs. 3, 4, 5. When the flowers are in separate groups, the spike is termed interrupted, as in some species of Mint.

4. A *Corymbus* consists of a common stalk from which partial flower-stalks proceed, which partial stalks are gradually longer as they are lower in the group, so that the flowers stand nearly on a level with each other, as in Yarrow, (*Achillea*) fig. 1, pl. 34; and most plants of class Tetradynamia.
5. A *Fascicle* is a close bundle of flowers upon erect, variously inserted, and subdivided peduncles, all forming a flat or even surface, as in Sweet-William, (*Dianthus barbatus*) and the Deptford Pink, (*Dianthus Armeria*) fig. 2.
6. A *Head* or *Tuft*, when the flowers are collected into a globular form at the extremity or summit of the stalk, as in Thrift, fig. 3. *Adoxa*, fig. 4, and Trefoil.
7. An *Umbel*, in which a number of flower stalks proceed like rays from a common centre, and commonly form a convex surface. In a simple umbel each ray or flower-stalk is simple and single flowered, as in Flowering-rush, fig. 5, and Ivy. In a compound umbel each ray or stalk bears an umbellule or partial umbel, as the Fool's-parsley, fig. 1, pl. 35. Hemlock and Carrot.

8. A *Cyme*; in this the flower-stalks proceed from a centre, as in the umbel, and rise to an even surface, but the stalks are variously subdivided, as in the Elder and Guelder-rose, fig. 2.
9. A *Panicle* bears the fructification in a loose, subdivided bunch or cluster, without any order, as the Creeping-soft, and many other Grasses, fig. 3.
10. A *Bunch* or *Thyrsus*, is a panicle contracted into an egg-shaped figure, as in Buckbean, (*Menyanthes*) fig. 4, and Butter-bur, (*Tussilago Petasites*.)

The APPENDAGES serve either to support or defend the parts of a plant on which they are found: they furnish excellent specific distinctions, and require therefore to be carefully considered.

There are several kinds of appendages.

1. *Stipulae*, small leaves or scales situated at the base of the leaf-stalk; very variously formed, usually growing in pairs, as in Vicia. Rose

and Cinquefoil, where they are united laterally to the leaf-stalk, and on the outside of it, fig. 1, pl. 36, fig. 3, pl. 37. In Persicaria they embrace the stem in an undivided tube. In the Grasses they consist of a white membrane, crowning the sheath of the leaf, and embracing the straw or culm, fig. 2. In the Yellow Vetchling, (*Lathyrus aphaca*) they supply the place of leaves ; the true leaves soon disappearing.

2. *Bracteæ*, floral leaves, or small leaves with which a flower stalk is frequently furnished. They are variously formed, sometimes coloured, and sometimes without colour. In the Lime-tree, (*Tilia europæa*) the floral leaf is single, oblong, and of a pale hue, fig. 3. In Marjoram, (*Origanum*) they are numerous, highly coloured, and imbricated over the calyces.
3. *Thorns*, growing from the interior of the plant, and therefore not coming off with the bark. They are terminal in the Buckthorn ; lateral in the Hawthorn ; on the leaves in the Cotton-thistle, (*Onopordon*) ; on the calyx in *Carduus* ; and on the fruit in Thornapple. They are either simple, as in *Prunus*, and *Rhamnus*, fig. 4 ; or branched, as in the Barberry, and *Ulex*, fig. 5.

4. *Prickles*, arising from the bark only, and coming off with it, as in the Rose and Bramble, fig. 1, pl. 37. They are either straight or hooked. Simple or triple.
5. The *Tendril*, by means of which the Vine, Red-berried Briony, and other plants of similar habit are assisted in climbing, fig. 2. It is a production of the leaves in some plants ; of the petioles in others. It is either simple, as in Bryonia, fig. 2, compound, as in the Tufted Vetch, (*Vicia cracca*) fig. 3,<sup>t</sup> or furnished with leaves, as in some species of *Lathyrus*.
6. *Glands*, or small tumours, as on the stem and calyx of the Moss-rose ; the leaf-stalks of the common Guelder-rose ; the serratures of the leaves of the Willow ; at the base of the leaf in the Bird-cherry, (*Prunus padus*) ; at the back of the leaf in Tamarisk ; on the surface of the leaf in Sundew ; on the Stipulæ in the Dog-rose, fig. 1, pl. 36 ; on the receptacle between the stamens in cruciform flowers ; on the petals in *Hypericum*.

7. *Hair*, with which many plants are furnished, and the nature of which is exceedingly various. In some cases it is so rigid as to be nearly analogous to the prickle, and in others so tender as to resemble down.

## VARIETIES.

IN plants of the same species, there are frequently great differences of character, arising from the soil, situation, and circumstances in which they are produced; and these differences are observable chiefly in their magnitude, time of flowering, scent, taste, duration, pubescence, form of their leaves, colour of their flowers, and the production of monstrous flowers.

Plants may differ from each other in any of these respects, and yet be of the same species; and then they are termed *Varieties*.

None of the characters above enumerated are permanent; that is to say, the seeds of a plant possessing a particular quality in either of those respects, may not produce other plants possessing that same quality. For instance, plants that are in warmer climates perennial, will, sometimes, in our climate become merely annual; and on the contrary, those which with us are annual, become, when propagated in a warmer region, perennial. And again, with respect to flowers, a plant which

has borne them of a blue or red colour may produce seeds the plants arising from which may bear white flowers.

Thus, although the flowers of the Woody Nightshade, Harebell, and Periwinkle, are commonly blue, yet they are occasionally white, although of the same species ; and white varieties also occur of the lesser Centaury, (*Chironia*) which is more usually red, and of the Wild Marjoram.

The leaves also, although in most cases affording beautiful specific characters, are yet frequently liable, in the same species, to remarkable variations : thus in the Ivy growing near the Tavistock tunnel, the leaves are linear, and exceedingly long ; a change in the character of the plant attributable to the strong current of air sweeping along the wall on which it is supported. —Cultivation occasionally causes a plant, the leaves of which are naturally flat, to bear them curled.

Many of the most valuable fruits, and most beautiful of the cultivated flowers, are merely varieties which have been produced by cultivation. The seeds of such plants would not afford fruits of the same flavour, nor flowers of the same hue. They can only be propagated by buds, grafts,

cuttings, layers, or roots ; and even thus a permanent character is not secured to them, for being artificial rather than natural productions, they return in time to the state from which they were raised.

In the gradual disappearance of certain varieties of the Apple, remarkable instances of this propensity have been observed.

The most permanent and important varieties are usually noticed in Botanical books, and Greek letters are commonly used to distinguish them.

## GLOSSARY OF TERMS

MOSTLY EMPLOYED IN THE SCIENCE OF BOTANY.

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### A

*Acaulis*, destitute of a stem, pl. 27, fig. 4.  
*Abortive*, barren, or imperfectly developed.  
*Abraded*, rubbed off.  
*Accumbent*, lying on, (see note, page 47.)  
*Acrose*, needle-pointed, page 67, pl. 6, fig. 2.  
*Acicular*, needle-shaped.  
*Aculeate*, furnished with prickles.  
*Acuminate*, taper-pointed, pl. 29, fig. 11.  
*Aggregate*, gathered together, page 23, pl. 16, fig. 7, pl. 34, fig. 3.  
*Akenium*, a hard pericarp enclosing a single loose seed, pl. 13, fig. 1,*a*.  
*Albumen*, the substance of a seed which lies under the skin.  
*Amentum*, catkin, page 9, pl. 2, fig. 3.  
*Amplexicaule*, stem clasping, pl. 32, fig. 9.  
*Androgynous*, stamens and pistil on the same plant, or in the same flower.  
*Annual*, page 61.  
*Anther*, page 15, pl. 11, fig. 1,*a*.  
*Antheriferous*, bearing anthers.  
*Apetalous*, without petals, pl. 16, fig. 2.  
*Apex*, the summit.  
*Apiculate*, terminating in a little point, generally formed by an extension of the mid-rib beyond the leaf.  
*Appressed*, when airs lie flat upon the surface of a plant; and when leaves are pressed close to the stem.  
*Arborescent*, tree-like.  
*Aridity*, dryness.  
*Aristate*, bearded, as in several grasses, pl. 2, fig. 5.  
*Articulate*, jointed, pl. 27, fig. 3.  
*Ascending*, page 62.  
*Attenuated*, made thin or slender.  
*Avens*, the beards of grasses, pl. 27, fig. 3.  
*Axilla*, the angle formed by the union of the stem and leaf, pl. 26, fig. 1, *a*.  
*Axillary*, placed in the angle formed by the union of the leaf and stem, pl. 23, *a, a, a*.  
*Axis*, the real or imaginary line that passes through any thing.

## GLOSSARY OF TERMS.

### B.

*Baccate*, berried; see *Berry*, page 19, pl. 13, fig. 4.  
*Band*, spaces between the ribs of the fruit of umbelliferous plants.  
*Banner*, page 13, pl. 9, fig. 5.  
*Beak*, a hard short point.  
*Bearded*, furnished with long hair like a beard.  
*Bicuspidate*, twice pointed.  
*Bidentate*, having two teeth.  
*Bifid*, two-cleft; divided into two segments.  
*Biennial*, page 61.  
*Bifarious*, placed in two rows.  
*Bilabiate*, two-lipped, pl. 4, fig. 10; pl. 9, fig. 1; pl. 21, fig. 1.  
*Bilobed*, having two lobes, pl. 30, fig. 1, page 67.  
*Bilocular*, having two cells, pl. 12, fig. 4.  
*Binate*, two together, pl. 30, fig. 1.  
*Bipartite*, two-parted, pl. 11, fig. 2.  
*Bipinnate*, twice pinnate, pl. 30, fig. 12.  
*Bipinnatifid*, twice pinnatifid.  
*Biterinate*, twice divided, in three.  
*Bivalved*, having two valves, pl. 12, fig. 1.  
*Border*, the upper portion of a monopetalous corolla, fig. 3, b, pl. 8.  
*Bracteate*, furnished with bractæ, or small leaves, near the calyx, or on any part of the flower-stalk.  
*Branchlets*, small branches.  
*Bristles*, rigid hairs.  
*Bulbiferous*, bulb-bearing.  
*Beneath*, applied to the germen when placed below the calyx, pl. 17, fig. 2, b, fig. 4 b; pl. 7, fig. 1 b.

### C

*Caducous*, falling off soon, page 11.  
*Cæspitose*, tufted or bundled, pl. 31, fig. 13.  
*Callous*, hardened.  
*Calycine*, belonging to the calyx.  
*Campanulate*, bell-shaped, pl. 8, fig. 1.  
*Canaliculate*, furrowed.  
*Canescent*, hoary, nearly white.  
*Capillary*, resembling a hair.  
*Capitate*, headed, pl. 34, fig. 3.  
*Carina*, a keel, page 13, pl. 9, fig. 7.  
*Carinate*, keeled, bent in form of a boat, pl. 9, fig. 7.  
*Carnose*, fleshy.  
*Catkin*, page 9, pl. 2, fig. 3; pl. 6, fig. 2.  
*Caudate*, tailed.  
*Caudex*, the trunk.  
*Caulis*, a stem.  
*Caulescent*, having a stem; opposed to *Acaulis*.  
*Cauline*, belonging to the stem.  
*Claw*, the bottom of a petal, page 13, pl. 7, fig. 3, d; pl. 9, fig. 5, a.  
*Confluent*, running into one another.  
*Conical*, cone-like, pl. 14, fig. 3.  
*Conjugate*, joined in pairs.  
*Connate*, united at the base, pl. 32, fig. 12.  
*Connivent*, converging.  
*Converging*, approaching together.  
*Convolute*, rolled together.  
*Cordate*, heart-shaped, pl. 28, fig. 13.  
*Coriaceous*, leathery.

## GLOSSARY OF TERMS.

*Corneous*, horny.  
*Cornute*, horned.  
*Corrugate*, shrivelled, wrinkled.  
*Corymb*, a mode of flowering, page 73, pl. 34, fig. 1.  
*Corymbose*, formed like a corymb, page 73, pl. 34, fig. 1.  
*Costate*, ribbed, page 70, pl. 31, fig. 8.  
*Cotyledon*, seed-leaves, pl. 28, fig. 1, or lobes, pl. 15, fig. 1, c.  
*Crenate*, notched, pl. 31, fig. 3.  
*Crenulate*, full of small notches.  
*Crest*, an appendage at the summit.  
*Crisp*, curled or much undulated at the margin, pl. 31, fig. 6.  
*Cruciform*, cross-shaped, page 12, pl. 7, fig. 3; pl. 16, fig. 1 c; pl. 18, fig. 4, c.  
*Culm*, the peculiar stem of grasses, pl. 27, fig. 3.  
*Cuniform*, wedge-shaped, pl. 28, fig. 15.  
*Cymbiform*, boat-shaped.  
*Cyme*, a mode of flowering, page 74, pl. 35, fig. 2.  
*Cymose*, flowering like a cyme, pl. 35, fig. 2.

### D

*Decandrous*, having 10 stamens, pl. 17, fig. 10,  
*Deciduous*, falling off; see pages 11 and 72.  
*Decumbent*, lying down on the ground.  
*Decurrent*, running down, page 71, pl. 32, fig. 10,  
*Decurrently pinnate*, when the leaflets of a pinnate leaf run down the stem, fig. 9, pl. 30.  
*Decussate*, when leaves alternately cross each other, pl. 31, fig. 14.  
*Deflexed*, bent downwards, pl. 32, fig. 5.  
*Dehiscent*, spontaneously bursting.  
*Deltoid*, triangular, pl. 28, fig. 10.  
*Dentate*, toothed at the edge, incisions in the margins resembling teeth.  
*Depressed*, pressed down, or flattened vertically.  
*Diandrous*, having 2 stamens, pl. 17, fig. 2.  
*Diaphanous*, transparent.  
*Dichotomous*, in pairs, or forked, page 61, pl. 26, fig. 3.  
*Didymous*, two conjoined, pl. 11, fig. 3.  
*Didynamious*, having two long and two short stamens, pl. 18, fig. 3.  
*Diffuse*, wide-spreading, scattered, pl. 35, fig. 3.  
*Digitate*, fingered, page 68, pl. 30, fig. 3.  
*Dioecious*, when a plant bears staminiferous flowers on one individual, and pistilliferous flowers on another, page 25, pl. 19, fig. 4.  
*Discoid*, a flower of the class Syngesia, bearing tubular florets only.  
*Discus*, disk, the central florets of a compound flower, pl. 22, fig. 2, form the disk.  
*Diphyllous*, two-leaved, page 7, pl. 4, fig. 2; pl. 7, fig. 1.  
*Dissepiment*, internal partitions of a seed vessel, pl. 12, figs. 4 and 5.  
*Distichous*, two-rowed, pl. 31, fig. 15.  
*Divaricatae*, wide-spreading.  
*Dodecandrous*, having twelve stamens, pl. 17, fig. 11.  
*Dorsal*, on the back.  
*Drupe*, a fruit containing a hard stone, page 19, pl. 13, fig. 2.

### E

*Echinated*, covered with prickles like a hedgehog.  
*Elliptical*, the length greater than the breadth, and the ends rounded.  
*Elliptic-lanceolate*, between elliptic and lanceolate.  
*Emarginate*, having a notch at the summit, pl. 29, fig. 12.  
*Embracing*, when a leaf clasps round the stem by its base, pl. 32, fig. 9.  
*Emersed*, standing out of the water.

## GLOSSARY OF TERMS.

*Entire*, without teeth, notches, or serratures on the margins, pl. 28, figs. 2–11.  
*Epidermis*, the outer or scarf skin.  
*Epiphyllous*, growing upon the leaf.  
*Erecto-patent*, between erect and spreading, pl. 32, fig. 3.  
*Eroded*, gnawed, bitten, irregularly toothletted.  
*Evergreen*, leaves remaining green during winter, page 71.  
*Evolved*, unfolded.  
*Excoriata*, stripped of the skin.  
*Excurrent*, running beyond the edge or summit of anything.  
*Exotic*, foreign; opposed to *Indigenous*, or native.  
*Exserted*, projecting beyond something else;—stamens exserted, fig. 3, pl. 18.  
*Extra-axillary*, above, or on the outside of the axils.

### F

*Fæcula*, the nutritious powder of wheat, &c.  
*Falcate*, sickle-form.  
*Falcato-securid*, bent on one side like a sickle.  
*Farinaceous*, abounding with flour.  
*Fascicles*, parcels or bundles, pl. 34, fig. 2.  
*Fasciculate*, arranged in bundles.  
*Fustigiate*, pyramidal.  
*Feroes*, thickly set with spines.  
*Ferruginous*, iron-coloured, rusty.  
*Fertile flower*, having pistils only.  
*Fibrillose*, covered with small fibres.  
*Fibrous*, composed of fibres.  
*Filament*, the stalk which supports the anther, pl. 11, fig. 1 a.  
*Filiform*, thread-shaped.  
*Funbriate*, fringed.  
*Fistulous*, hollow like a pipe.  
*Flexuous*, zigzag, undulated, forming angles.  
*Flocci*, little tufts like wool.  
*Floral-leaves*, bractæ, small leaves attached to the flower-stalk.  
*Floret*, little flowers; applied to those which constitute compound and aggregate flowers, pl. 16, fig. 4, a, fig. 5, b, fig. 7.  
*Flosculosus*, compound flowers, consisting of many tubular florets.  
*Foliaceous*, having the form of leaves.  
*Follicle*, a one-valved, one-celled capsule, opening lengthwise.  
*Fringed*, margined with a row of hairs.  
*Frond*, a leaf bearing the fructification of cryptogamic plants, page 65, pl. 27, fig. 5.  
*Fruticose*, shrubby.  
*Fugacious*, of short duration.  
*Furcate*, forked.  
*Furrowed*, marked with parallel elevated and depressed lines.  
*Fusiform*, spindle-shaped, pl. 24, fig. 3.

### G

*Galea*, the helmet or upper lip of a ringent corolla, pl. 9, fig. 1.  
*Geminata*, doubled.  
*Gemmæ*, leafy buds.  
*Germen*, base of the pistil, fig. 3, pl. 1; rudiment of the fruit, fig. 4, pl. 1.  
*Germination*, the first act of vegetation in a seed.  
*Germen inferior*, below the flower, fig. 1, b pl. 7, fig. 2, b fig. 4, b pl. 17, fig. 8, pl. 11.

## GLOSSARY OF TERMS.

*Germen superior*, above the flower, fig. 7, pl. 11.

*Gibbous*, protuberant.

*Glabrous*, smooth, naked, bald.

*Glandular*, furnished with glands, or small soft bodies secreting fluid.

*Glaucous*, invested with a pale greenish-blue mealiness.

*Globose*, round or spherical.

*Glomerate*, gathered into a head, pl. 34, figs. 3, 4.

*Glottis*, the throat of a corolla, pl. 9, fig. 1<sup>r</sup>.

*Gluaceous* plants, those whose flowers are like those of grasses.

*Glumes*, the floral envelopes of a grass, pl. 2, fig. 5, pl. 6, fig. 4, 5, 6, 7.

*Gnawed*, irregularly notched at the margin.

*Granulated*, when a root consists of small bulbs or scales, pl. 25, fig. 5.

*Granular*, invested as if with grains,

*Gynandrous*, stamens and pistil combined, pages 25, 27, pl. 19, fig. 2.

### H

*Habit*, general appearance of a plant.

*Habitat*, the locality of a plant.

*Hastate*, like the head of an halbert, pl. 28, fig. 17.

*Helmet*, the galea or upper lip of a ringent corolla, pl. 9, fig. 1.

*Herbaceous*, soft, not woody, perishing annually.

*Hermaphrodite* flower, when containing both stamens and pistil.

*Hexagonal*, six-sided.

*Hexandrous*, having six equal stamens, pl. 17, fig. 6.

*Hexangular*, six-angled.

*Hexapetalous*, having six petals.

*Hirsute*, invested with soft hairs.

*Hispid*, rough with stiff hairs,

*Hoary*, invested with close downy hairs.

*Husks*, the glume or envelopes of the flowers of grasses, page 10, pl. 2, fig. 5; pl. 6, figs. 4, 5, 6, 7.

*Hybrid*, partaking of the nature of two species.

*Hypocrateriform*, salver-shaped, pl. 8, fig. 3.

### I

*Imbricate*, laid one over another, pl. 31, fig. 12.

*Immersed*, under water.

*Imperfect flower*, when either the stamens or pistils are wanting.

*Incised*, cut.

*Incomplete flower*, when the corolla is wanting, pl. 16, fig. 2.

*Incassated*, becoming thicker towards the end.

*Incurred*, bending inwards.

*Indehiscent*, not bursting; opposed to dehiscent.

*Indigenous*, native of a country.

*Inferior flower*, when the calyx and corolla are beneath the germen, pl. 11, fig. 7.

*Inflected*, bent inwards.

*Inflorescence*, mode of flowering, or the arrangement of flowers, page 72.

*Infundibuliform*, funnel-shaped, pl. 8, fig. 2.

*Internodes*, the space between the joints of a plant.

*Interruptedly pinnate*, having smaller leaflets between the larger, pl. 30, fig. 8.

*Inverse*, inverted.

*Inversely-cordate*, inversely heart-shaped, pl. 18, fig. 5; pl. 30, fig. 2.

*Involucre*, or *Involucrum*, the bractæ which accompany the flowers of umbelliferous plants, pl. 2, fig. 2 *a*; and the calycine leaflets which surround the florets of compound flowers, pl. 19, fig. 1, *a*.

*Involucels*, the partial involucre of umbelliferous plants, pl. 2, fig. 2 *b*.

*Inolute*, rolled inwards at the margin.

## GLOSSARY OF TERMS.

### J

*Jugged*, irregularly cut at the margin.  
*Joints*, the articulations of a stem, pl. 27, fig. 3.

### K.

*Keel*, the lower petal of a papilionaceous flower, pl. 9, fig. 7.  
*Keeled leaves*, or other parts, when longitudinally prominent at the back.  
*Kneed*, when the joints are enlarged and bent like a knee.

### L.

*Laciniate*, cut into segments.  
*Lactescent*, yielding a milky juice.  
*Lamina*, or *plate*, applied to a leaf exclusive of its petiole, and to the upper and enlarged portion of a petal, pl. 9, fig. 5 b.  
*Lanceolate*, lance or spear-shaped, pl. 28, fig. 7.  
*Lanceolate-subulate*, between lanceolate and subulate.  
*Lateral*, on one side,  
*Leaflets*, parts of a compound leaf, pl. 30, figs. 5, 6.  
*Legume*, a pod, the fruit of papilionaceous flowers, page 19, pl. 12, fig. 9.  
*Leguminous*, plants which bear legumes.  
*Lenticular*, resembling a lens.  
*Ligula*, the stipule of grasses, page 75, pl. 37, fig. 2.  
*Ligulate*, strap-shaped, pl. 8, fig. 7; pl. 16, fig. 4 a.  
*Linear*, having the margins parallel, pl. 28, fig. 8.  
*Linear-lanceolate*, between linear and lanceolate  
*Lingulate*, tongue-shaped.  
*Loculaments*, cells of a seed vessel, page 18.  
*Lobed*, divided into rounded segments, pl. 29, fig. 4; pl. 30, fig. 1.  
*Lucid*, bright, shining.  
*Lunate*, in form like a half-moon.  
*Lurid*, a colour between purple, yellow, and grey.  
*Lyrate*, lyre-shaped; applied to a pinnatifid leaf, whose terminal segment is rounded and larger, pl. 28, fig. 20.

### M

*Melliferous*, honey-bearing.  
*Membranous*, very thin, dry, having the texture of a membrane.  
*Midrib*, the elevated line from the base to the apex of the leaf, formed by an elongation of the petiole.  
*Monodelphus*, when the filaments are combined in one set, pages 25, 47, pl. 18, fig. 5.  
*Monandrous*, having one stamen pl. 17, fig. 1.  
*Monopetalous*, consisting of one petal, pl. 1, fig. 1; pl. 8, figs. 1—6  
*Monocotyledons*, having one seed-leaf or lobe.  
*Monoecious*, stamens in one flower and pistils in another, page 25, pl. 19, fig. 3.  
*Monospermous*, one-seeded.  
*Mucronate*, pointed sharp.  
*Muricated*, invested with short sharp points.

### N

*Naked flower*, when destitute of a calyx, pl. 16, fig. 3.  
*Navicular*, boat-shaped.  
*Nectariferous*, secreting or bearing honey, page 13,  
*Needle-shaped*, leaves, linear and evergreen, page 67, pl. 6, fig. 2.  
*Nerves*, the stronger veins upon leaves.

## GLOSSARY OF TERMS.

*Neutral flowers*, without either stamens or pistils.

*Nodose*, having nodi or knots.

*Nodules*, small hard knots.

*Nut*, a seed enveloped with a hard shell, which does not burst, pl. 13,  
fig. 1, a.

*Nucleus*, the kernel.

### O

*Ob.* indicative that a thing is inverted.

*Obocordate*, inversely cordate, pl. 18, fig. 5, o; pl. 30, fig. 2.

*Oblique*, pl. 18, fig. 5, o; pl. 29, fig. 8.

*Obovate*, inversely ovate.

*Octandrous*, having eight stamens, pl. 17, fig. 8.

*Oleraceous*, esculent, eatable.

*Opercular*, covered with a lid.

*Operculum*, a lid.

*Oppositely pinnate*, when the leaflets of a pinnate leaf are opposite,  
pl. 30, fig. 6.

*Orbicular*, round and flat, pl. 28, fig. 2.

*Oval*, the length greater than the breadth, and both ends alike rounded.

*Ovary*, the part of a flower in which the seeds are contained.

*Ovate*, egg-shaped, pl. 28, fig. 4.

*Ovate-lanceolate*, between ovate and lanceolate.

*Ovoid*, egg-like.

*Ovules*, the young seeds of plants within the ovary.

### P

*Palate*, the mouth of a ringent, and of a personate corolla, pl. 9, fig. 2 p.

*Palmate leaf*, having several oblong segments extending to the middle,  
pl. 29, fig. 6.

*Panduriform*, fiddle-shaped, pl. 28, fig. 18.

*Panicle*, a mode of flowering resembling fig. 3, pl. 35, page 74.

*Papilionaceous*, butterfly-shaped flowers, page 12, pl. 9, fig. 4.

*Papillose*, producing small soft prominences.

*Pappus*, an appendage crowning the seeds or fruit of plants of the class  
Syngenesia, page 21, pl. 15, figs 2, 3.

*Partial umbel*, the secondary divisions of an umbel, pl. 2, fig. 2

*Partial involucre*, bractæ of the secondary divisions of an umbel, pl. 2,  
fig. 2, b.

*Patent*, spread out, or expanded, pl. 32, fig. 4.

*Pectinate*, pinnatifid, resembling the teeth of a comb.

*Pedate leaf*, a ternate leaf, having its lateral leaflets divided into several  
segments, pl. 30, fig. 4.

*Pedicellate*, slightly stalked.

*Pedicels*, small footstalks of flowers.

*Peduncle*, flower-stalk.

*Pellicle*, a thin skin.

*Peltate leaf*, when the petiole, or stalk is fixed in the middle, instead of  
the margin, pl. 32, fig. 14.

*Pentagynous*, having five pistils.

*Pentandrous*, having five stamens, pl. 17, fig. 5.

*Pentapetalous*, having 5 petals, pl. 7, fig. 4.

*Perennial*, continuing many years, page 61.

*Perfect flowers*, having both stamens and pistils.

*Perfoliate*, when the stem passes through the leaf, pl. 32, fig. 13.

*Perianth*, a calyx contiguous to the corolla; a term applied when the  
calyx cannot be distinguished from the corolla.

*Pericarp*, a seed-vessel, pages 6 and 18.

## GLOSSARY OF TERMS.

*Permanent leaves*, remaining unchanged through the winter, page 71.  
*Persistent calyx or corolla*, remaining until the fruit is ripe, page 11.  
*Personate*, when a corolla with two lips is closed at the throat, pl. 9, fig. 2; pl. 10, fig. 2.  
*Petals*, the distinct pieces of a corolla, page 11.  
*Petaloid*, like a petal.  
*Petiole*, a leaf-stalk, pl. 32, fig. 7.  
*Petiolate*, having foot-stalks.  
*Phenogamous plants*, such as are visibly furnished with stamens and pistils.  
*Pilose*, slightly hairy.  
*Pinnate*, when several leaflets proceed from a common leaf-stalk, page 68, pl. 30, figs. 5, 6.  
*Pinnatifid*, when cut or divided into lobes from the margin nearly to the mid-rib, pl. 29, fig. 7.  
*Pistil*, the central organ of a flower, consisting generally of three parts, page 17, pl. 1, fig. 3; pl. 11, fig. 6.  
*Plaited*, folded, pl. 31, fig. 5.  
*Plane*, flat.  
*Plicate*, plaited, folded, pl. 31, fig. 5.  
*Plumose*, resembling feathers.  
*Pod*, a long seed-vessel of two valves, such as that of the pea tribe, pl. 12, fig. 9; and some of the cruciform flowering plants, pl. 12, fig. 8.  
*Pollen*, the dust or minute globules contained in the anther, pl. 11, fig 1 c.  
*Polyandrous*, having more stamens than 20, pl. 18, fig. 2.  
*Polygamous plant*, when some of its flowers contain stamens only, others pistils only, and others both stamens and pistils.  
*Polygynous*, having numerous pistils, pl. 20, fig. 10.  
*Polypetalous*, having many petals, pl. 7, fig. 5.  
*Polyspermous*, many-seeded.  
*Pome*, an apple, page 19, pl. 13, fig. 3.  
*Pores*, apertures in the cuticle.  
*Pouch*, a short pod, page 19, pl. 12, figs. 6, 7.  
*Procumbent*, lying on the ground, page 62.  
*Proliferous plant*, when it forms numerous young plants about its roots.  
*Purient*, stinging.  
*Pubescent*, downy, invested with close-pressed hairs.  
*Pyriform*, shaped like a pear.

### Q

*Quadrangular*, four-angled.  
*Quadriferous*, arranged in four rows.  
*Quadrifid*, divided four times.  
*Quinate leaf*, compound with five leaflets.  
*Quinquefid*, divided into five.  
*Quinguangular*, flat, with five corners.  

### R

*Raceme*, a mode of flowering, page 72, pl. 32, fig. 2.  
*Racemose*, flowering in racemes, pl. 32, fig. 2.  
*Rachis*, that part of the stem which bears the flowers.  
*Radiate*, when the marginal florets of a compound flower are long and spreading, pl. 16, fig. 6; pl. 22, fig. 2.  
*Radical*, proceeding from the root, pl. 25, fig. 9, r.; pl. 27, fig 4, r.  
*Radius*, the ray, or marginal florets of a compound flower, pl. 16, fig. 6; pl. 22, fig. 2.  
*Radicating*, throwing out roots from the stem.  
*Ramifications*, subdivisions of roots or branches.

## GLOSSARY OF TERMS.

*Ramose*, branchy.

*Ramuli*, twigs or small branches.

*Receptacle*, the base upon which all the other parts of a flower rests.  
pl. 14, figs. 1—6.

*Reclinate*, inclining downwards.

*Recurved*, bent backwards, pl. 32, fig. 5.

*Reflexed*, bent backwards, pl. 32, fig. 5.

*Retuse*, ending in a broad shallow notch.

*Reniform*, kidney-shaped, pl. 18, fig. 12.

*Replicate*, folded back.

*Resupine*, inverted.

*Reticulated*, resembling a net.

*Revolute*, rolled back, pl. 32, fig. 6.

*Ribbed leaf*, when the petiole extends through the leaf in parallel lines,  
pl. 31, fig. 8.

*Ringent*, gaping, pl. 9, fig. 1, pl. 28, fig. 3.

*Rotate*, wheel-shaped; corolla when the limb is flat, and the tube very  
short, pl. 8, fig. 4.

*Rudiment*, when an organ is imperfectly developed.

*Runcinate*, pinnatifid; with the segments pointed, and mostly directed  
downwards, pl. 28, fig. 19.

*Rugose*, rough, or coarsely wrinkled.

### S

*Sagitate*, arrow-shaped, pl. 28, fig. 16; pl. 11, fig. 4.

*Samara*, a winged seed-vessel, pl. 15, figs. 4, 5.

*Sarmentose*, producing runners.

*Scabrosa*, rough with small asperities.

*Scales*, membranous leaf-shaped processes.

*Scandent*, climbing, page 62, pl. 27, figs. 1, 2.

*Scape*, a flower-stalk arising from the root, page 64, pl. 27, fig. 4.

*Scariose*, membranous and dry.

*Scion*, a shoot.

*Secund*, on one side only.

*Segments*, divisions of a calyx, leaf, &c.

*Semi*, half.

*Seminal*, belonging to the seed.

*Sepals*, the segments of the calyx.

*Septa*, the partitions that divide the interior of the fruit, pl. 12, figs. 4,  
5, 7.

*Serrated* cut, like the teeth of a saw, pl. 31, fig. 1.

*Serrulations*, notchings like those of a saw, pl. 31, fig. 1.

*Sessile*, without a stalk, pl. 32, fig. 8; pl. 33, figs. 4, 5.

*Setaceous*, bristle-shaped.

*Setax*, bristles.

*Setose*, invested with bristles.

*Sheath*, a membranous envelope of a flower, and finally bursting lon-  
gitudinally, pl. 10, fig. 4, s.

*Sheath* of a leaf, the lower part of the leaf of a grass, which encloses  
the straw.

*Silicle*, a small pod, the fruit of some cruciform flower-bearing plants,  
pl. 12, fig. 6; pl. 21, fig. 3.

*Silique*, a long pod, the fruit of some cruciform plants, page 18, pl. 12,  
fig. 8; pl. 21, fig. 4.

*Simple*, undivided, or consisting of one; the reverse of compound.

*Sinus*, the recesses formed by the lobes of leaves, pl. 29, fig. 4.

*Smooth*, destitute of hairs.

## GLOSSARY OF TERMS.

*Sori*, the patches of fructification on the bark of the frond in ferns.  
*Spatha*, a sheathing leaf enclosing the flower, pl. 6, fig. 3.  
*Spathaceous*, furnished with a spathe, pl. 6, fig. 3; pl. 10, fig. 4, *s.*  
*Spatulate*, circular at the end, and tapering towards the base, pl. 28, fig. 15.  
*Spherical*, round, like a sphere.  
*Spheroidal*, almost a sphere.  
*Spike*, a mode of flowering, page 72, pl. 33, figs. 3, 4, 5.  
*Spikelet*, applied to grasses and other plants, where the inflorescence is made up of small spikes.  
*Spindle-shaped root*, when thick and fleshy, tapering downwards, pl. 23, fig. 3.  
*Spine*, hardened, acute processes arising from the wood, page 75, pl. 36, fig. 4.  
*Spinous*, full of spines.  
*Spur*, a tapering process of the corolla, page 13, pl. 10, figs. 1 and 2.  
*Squamose*, having scales.  
*Squarrose*, spreading rigidly at right angles.  
*Stamen*, one of the essential organs of fructification, pages 5, 15; pl. 11, fig. 1.  
*Staminiferous*, producing stamens and not pistils.  
*Standard*, a banner, the upper part of a papilionaceous flower, page 13, pl. 9, fig. 5.  
*Stellate*, in the form of a star, pl. 31, fig. 11.  
*Sterile*, barren; flower, when destitute of a pistil, pl. 19, fig. 4, left-hand flower.  
*Style*, the summit of the pistil, pl. 11, fig. 6, *c.*  
*Stimuli*, stinging hairs.  
*Stipules*, small appendages to a leaf, page 74, pl. 36, fig. 1, pl. 37, fig. 3.  
*Stoloniferous*, with creeping roots, page 60.  
*Striated*, marked with parallel streaks, faint channels or furrows.  
*Strobile*, an enlarged and hardened catkin, page 9.  
*Style*, the intermediate part between the germen and stigma of a pistil, page 17, pl. 11, fig. 6 *b.*  
*Sub*, somewhat.  
*Submersed*, partly under water.  
*Subulate*, awl-shaped.  
*Succulent*, fleshy and filled with juice.  
*Subfruticose*, somewhat shrubby.  
*Sulcate*, furrowed.  
*Supra-decompound*, doubly compounded.  
*Surculi*, young shoots.  
*Suture*, a line formed by the union of two parts.  
*Syngenesious*, belonging to the class Syngnesia, page 25, 27, 51, pl. 16, figs. 4, 5, 6; pl. 19, fig. 1.

**T**

*Tail*, a long feathery or hairy appendage to a fruit or seed.  
*Tap-root*, thick and fleshy; tapering downwards, pl. 24, fig. 3.  
*Tendril*, a slender, thread-like support to a plant, pl. 37, figs. 2, 3.  
*Terminal*, at the end of a branch or stem.  
*Ternary*, consisting of threes.  
*Ternate leaf*, when the three leaflets originate from a common stalk, pl. 30, fig. 2.  
*Testa*, the skin or integument of a seed.  
*Tetradynamous*, having four long, and two short stamens, page 46, pl. 18, fig. 4.  
*Tetrandrous*, having four equal stamens, pl. 17, fig. 4.

## GLOSSARY OF TERMS.

*Tetrapetalous*, having four petals, pl. 7, fig. 3.  
*Thorn*, a rigid, acute appendage arising from the wood, pl. 36, fig. 4.  
*Thread-shaped*, elongated, cylindrical, and slender.  
*Thrice pinnate*, divided three times in a pinnate manner, pl. 30, fig. 12.  
*Throat*, the orifice of a corolla, pl. 8, fig. 3 b; pl. 9, fig. 1, t.  
*Thyrse*, a mode of flowering, page 74, pl. 35, fig. 4.  
*Thysoid*, inflorescence thyrs-like, pl. 35, fig. 4.  
*Tomentose*, densely hairy.  
*Toothed*, cut at the margin so as to resemble teeth.  
*Toothletted*, the margin furnished with little teeth.  
*Torse*, uneven.  
*Tortoise*, twisted.  
*Triandrous*, having three stamens, pl. 17, fig. 3.  
*Trichotomous*, divided into threes.  
*Tricuspidate*, having three points.  
*Trifarious*, in a triple rank.  
*Trifid*, divided in three.  
*Trigeminate*, thrice paired.  
*Trilocular*, having three cells, pl. 12, fig. 5.  
*Trilobate*, thrice ternate.  
*Trivalved*, having three valves, pl. 12, fig. 2.  
*Truncate*, blunt, cut off.  
*Tuberulate*, invested with knobs and tubercles.  
*Tuberous*, having solid, fleshy, roundish roots, like the potatoe.  
*Tumid*, swelling.  
*Tunic*, a coat.  
*Tunicated*, coated.  
*Turbinate*, spherical and depressed, having the form of a top.  
*Turgid*, swollen, puffed.

### U

*Umbel*, a mode of flowering, page 73, pl. 2, fig. 2; pl. 35, fig. 1.  
*Umbellules*, secondary or ultimate divisions of an umbel, pl. 2, fig. 2.  
*Undivided*, entire, without divisions.  
*Unarmed*, without prickles or spines.  
*Uncinate*, hooked.  
*Undulated*, waved at the margin.  
*Unequal*, some longer than others.  
*Unguis*, a claw; the base of a petal, page 13, pl. 7, fig. 3, d; pl. 9, fig. 5, a.  
*Unilateral*, all inclining one way.  
*Unilocular*, one-celled, pl. 12, figs. 1, 3.  
*Urceolate*, pitcher-shaped.  
*Utricle*, a little bottle or bladder.

### V

*Valvular*, consisting of valves, page 18, pl. 12, figs. 1, 2.  
*Veined*, page 70, pl. 37, fig. 7.  
*Ventricose*, inflated, pl. 5, fig. 5.  
*Vernal*, belonging to the Spring.  
*Versatile*, swinging on the summit of a stalk, like a vane.  
*Vertex*, the uppermost point.  
*Vertical*, perpendicular.  
*Verticillate*, whorled; when leaves encircle the stem, pl. 31, fig. 11.  
*Vesicled*, invested with hollow excrescences.  
*Vexillum*, a standard; the banner or upper petal of a papilionaceous corolla, page 13, pl. 9, fig. 5.

## GLOSSARY OF TERMS.

*Villous*, shaggy, with long loose hair.

*Virgate*, twiggy.

*Viscid*, adhesive, clammy.

### W

*Warty*, invested with small hard prominences.

*Wedge-shaped*, broad at the end, tapering downwards, pl. 28, fig. 15.

*Wheel-shaped*, see rotate.

*Whorls*, leaves or flowers encircling the stem, pl. 31, fig. 11 ; pl. 33, fig. 1.

*Wing*, of a seed, a membranous border or appendage, pl. 15, figs. 4, 5.

*Wings*, the lateral petals of a papilionaceous corolla, page 13, pl. 7, fig. 6.

*Winged stem*, with edges extended into leafy borders.

*Woolly*, invested with long, soft, interwoven hairs.

### Z

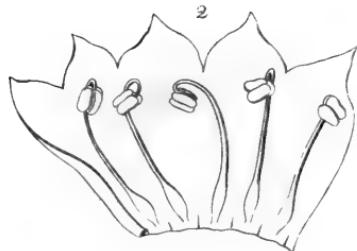
*Zigzag*, flexuose, bent alternately from right to left, and from left to right.

*Zones*, stripes or belts.

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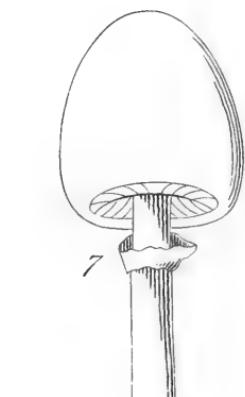
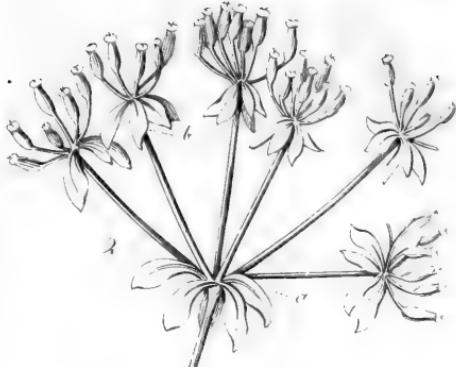


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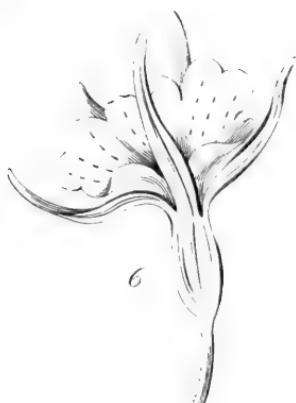




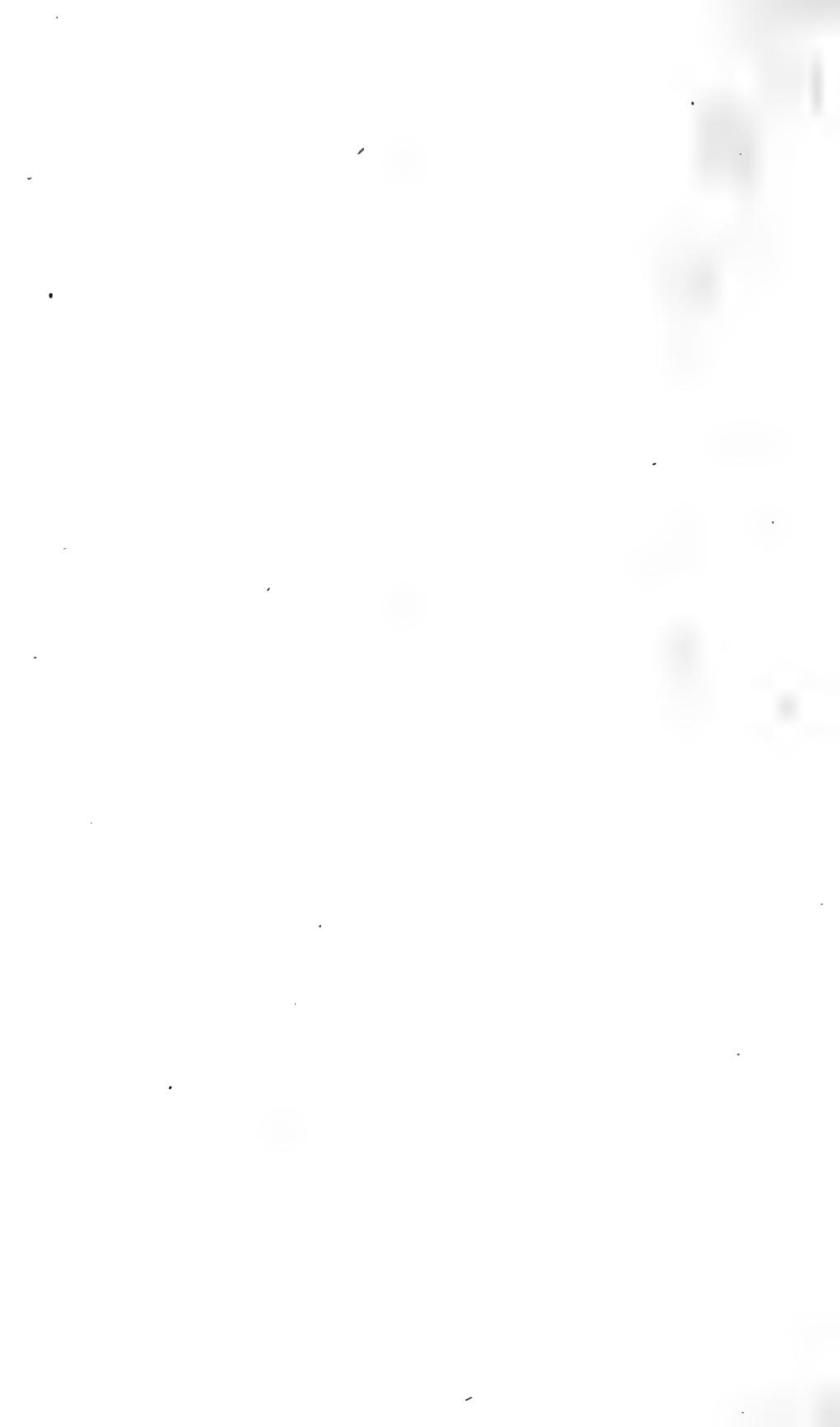
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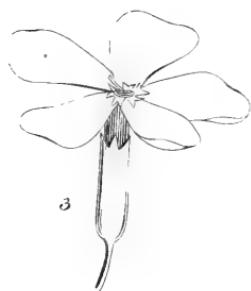


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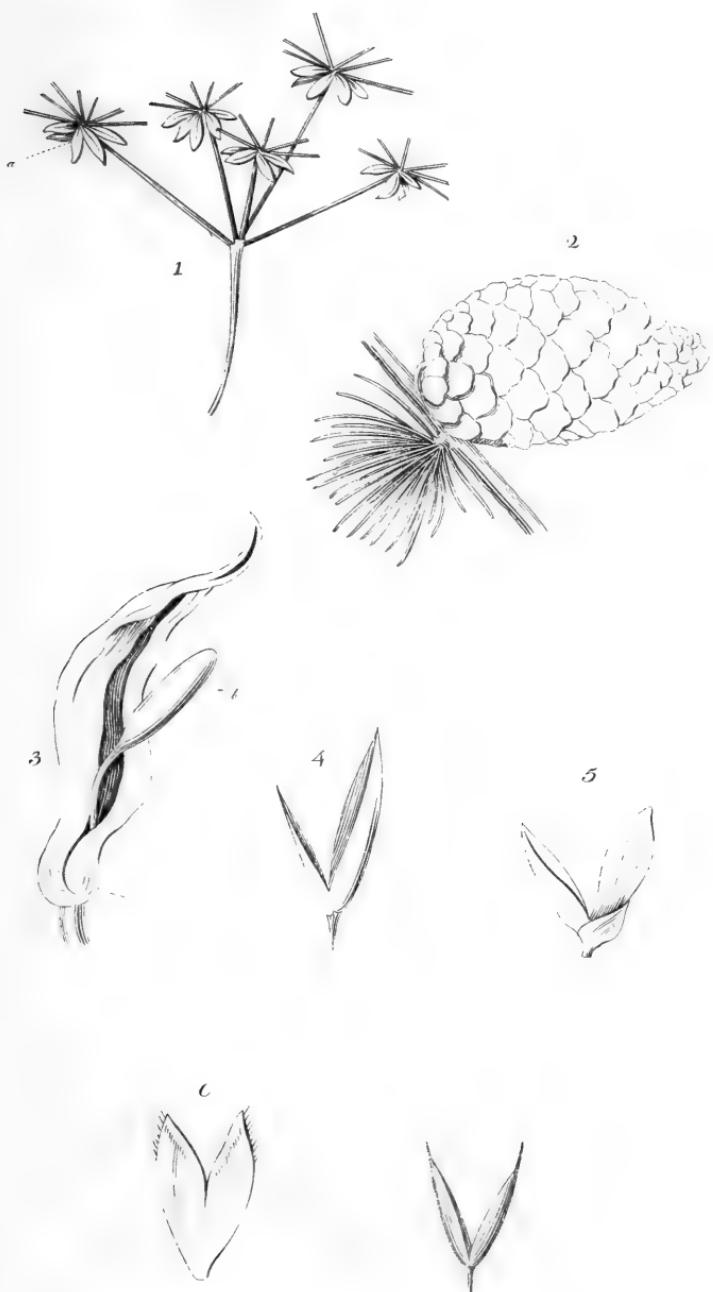


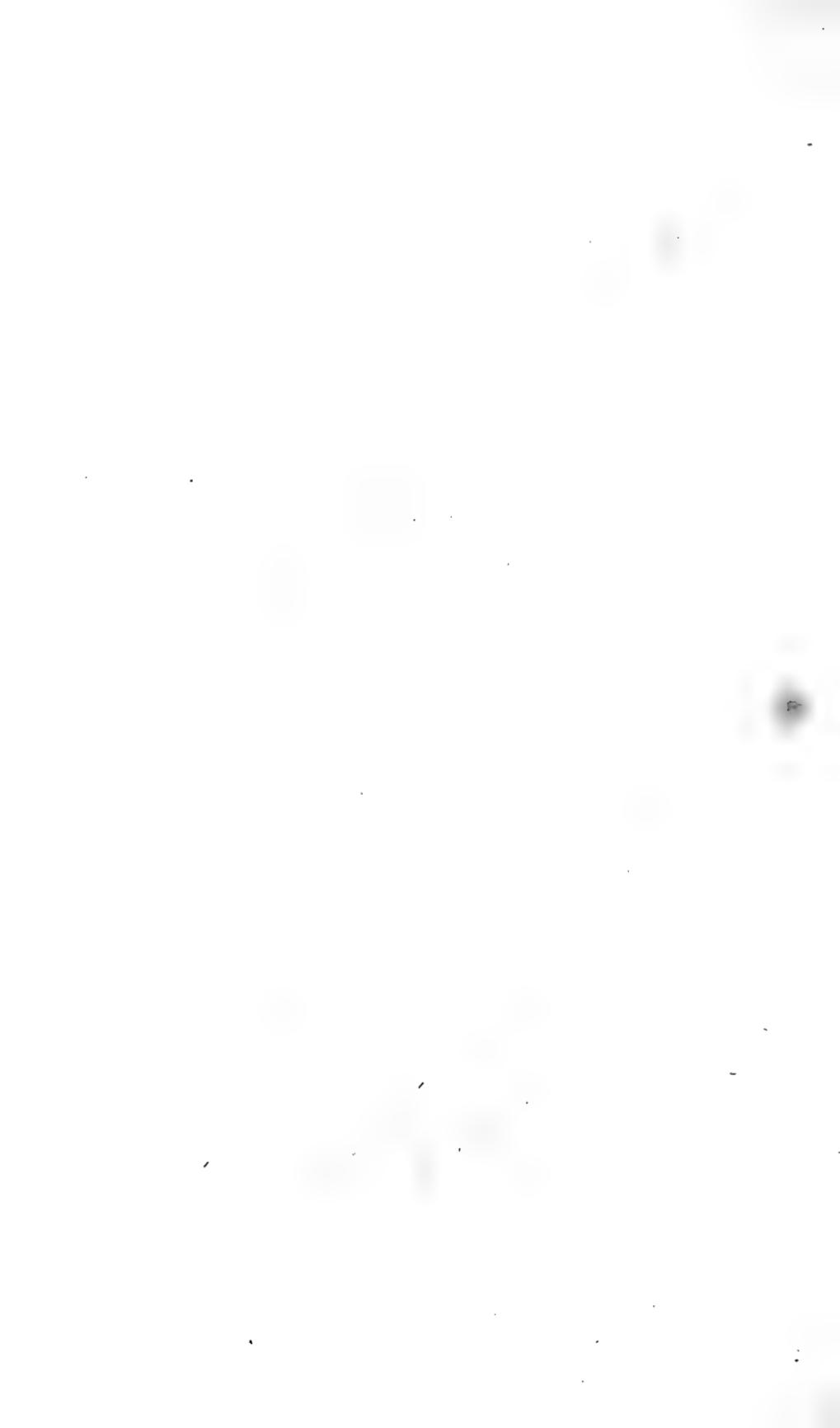
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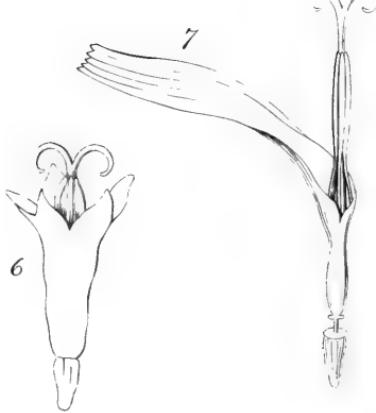
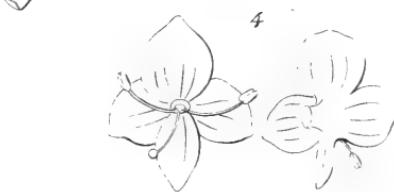
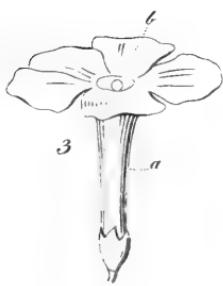


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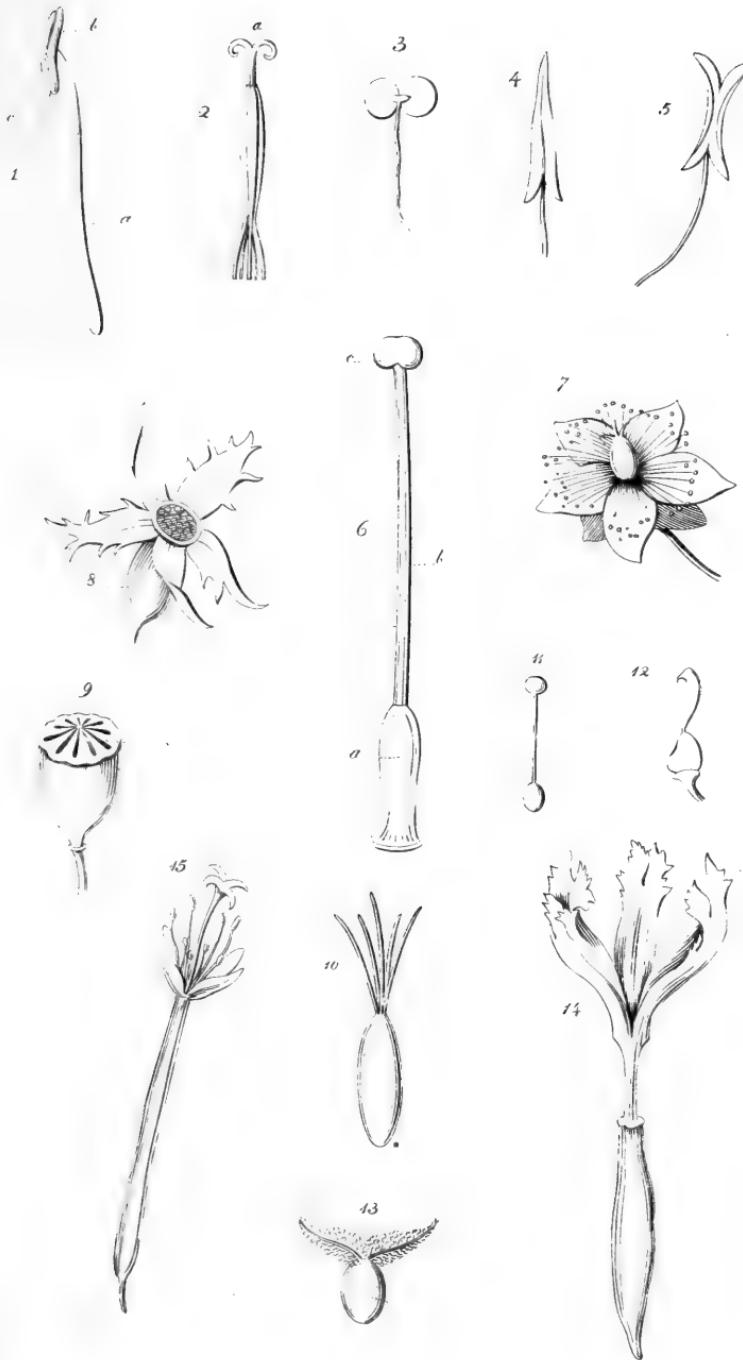


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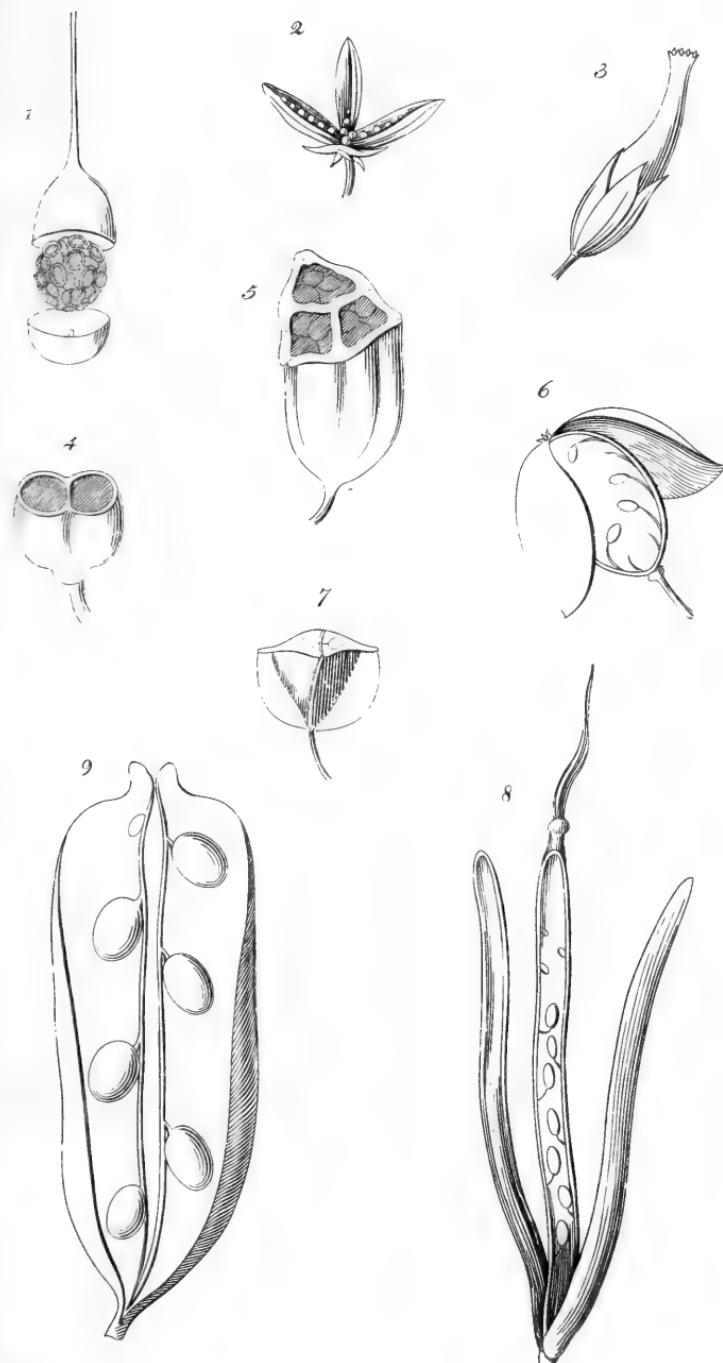


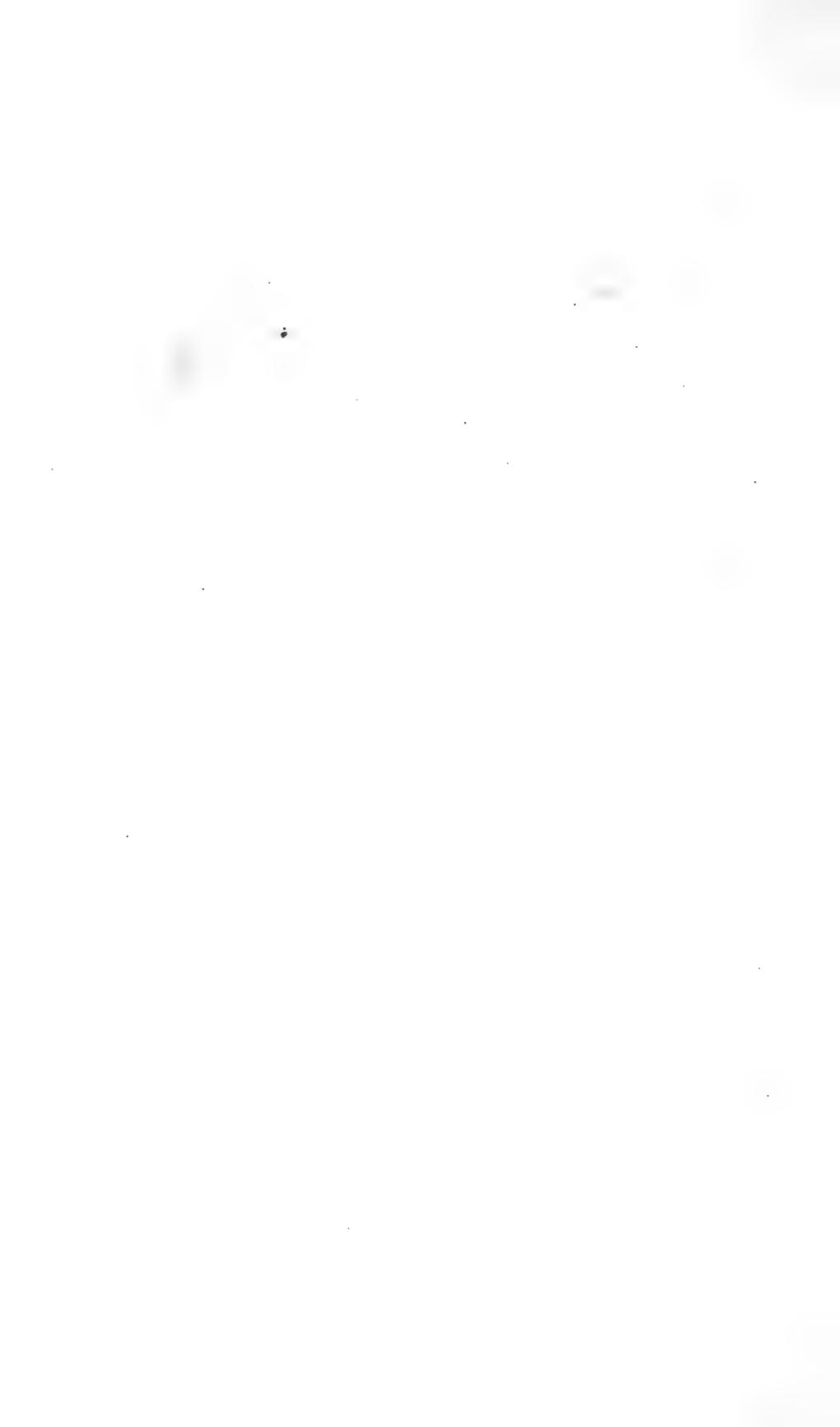
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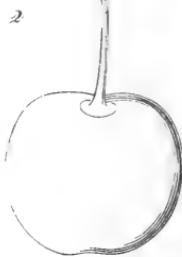
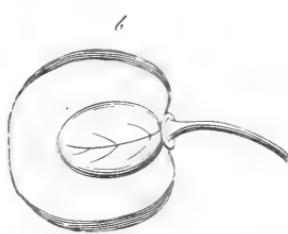




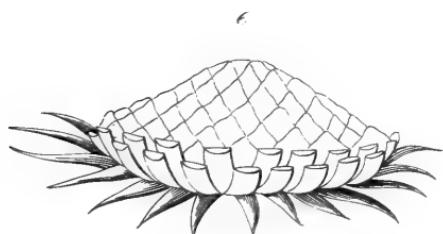
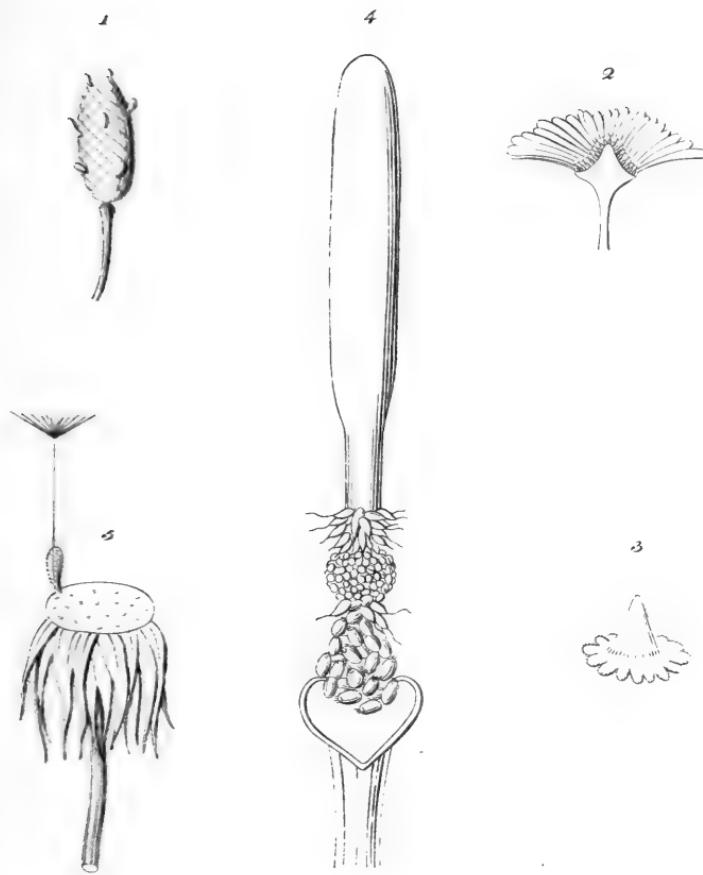




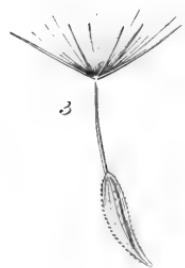
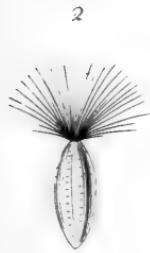




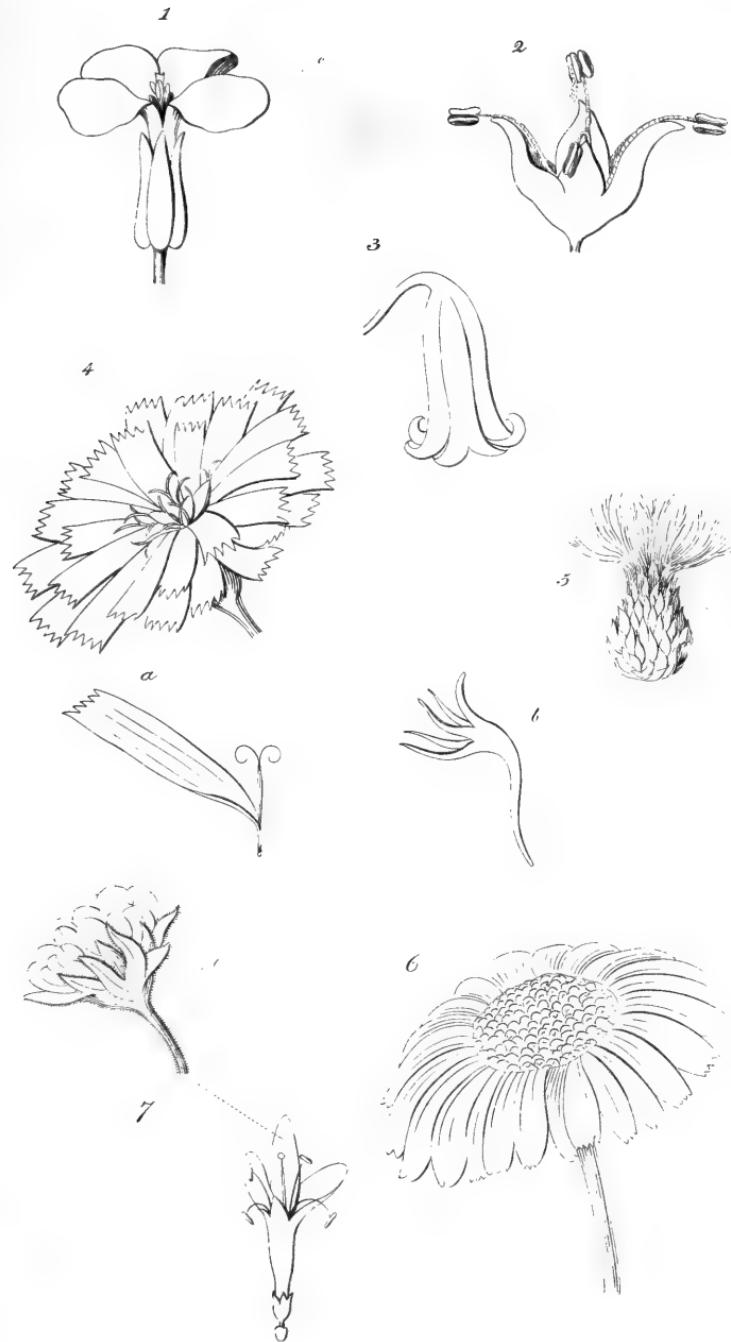
















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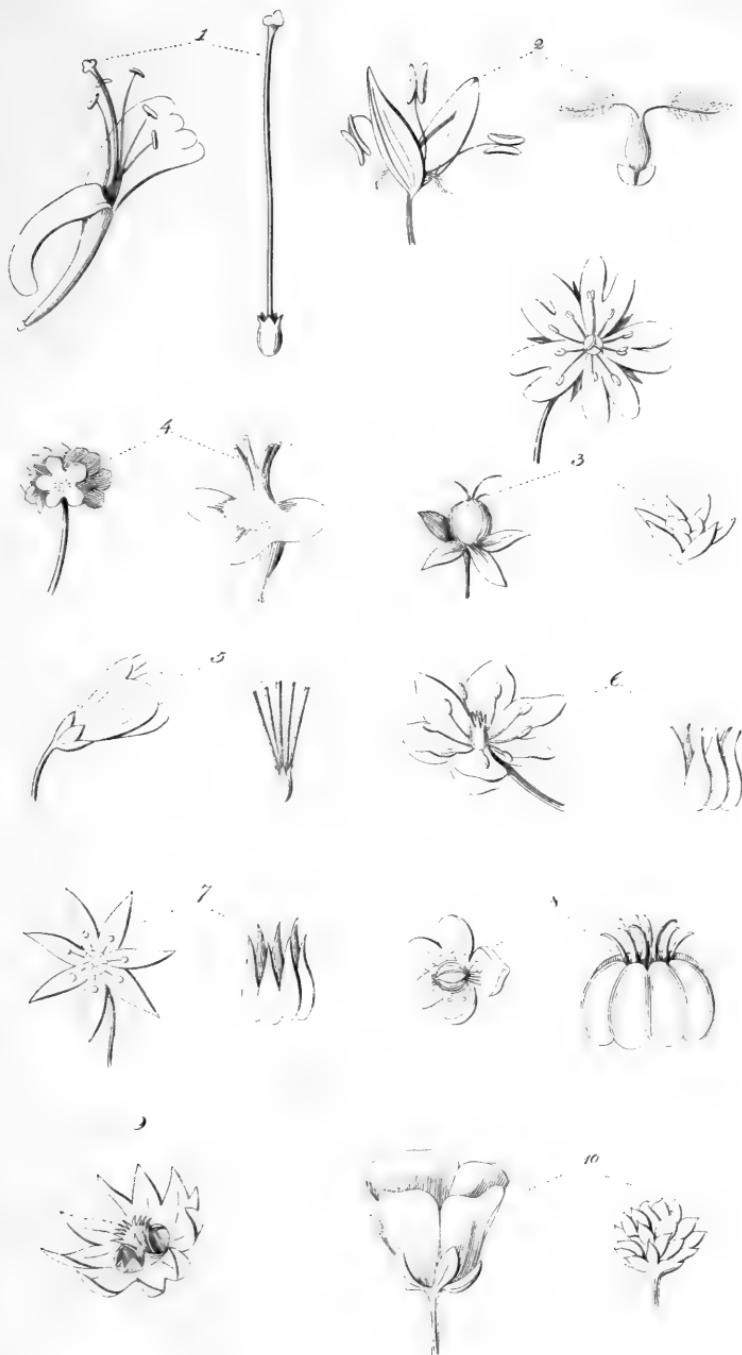






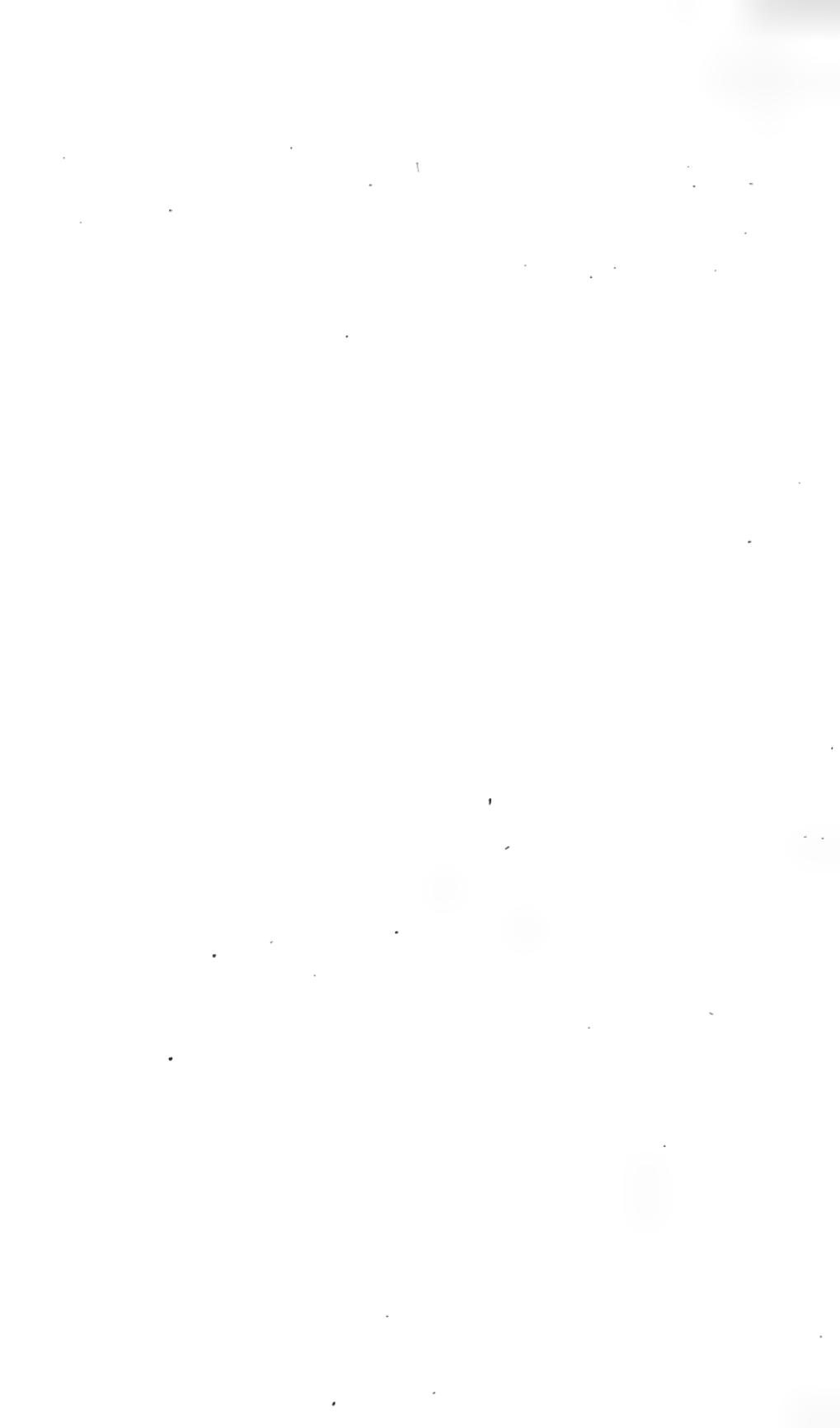












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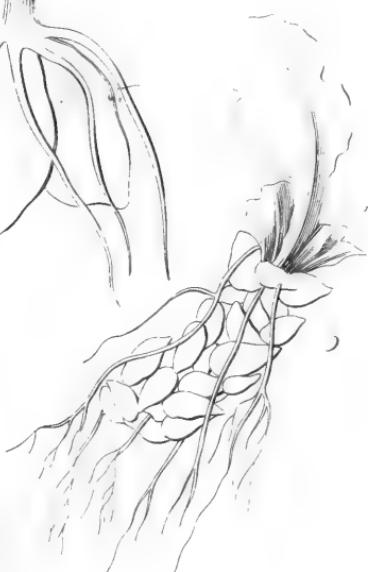
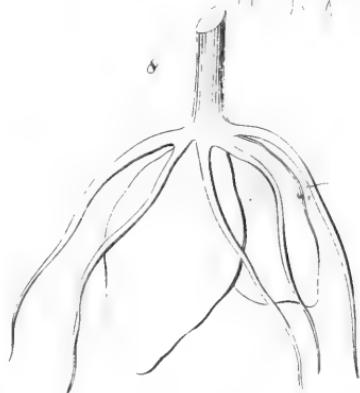
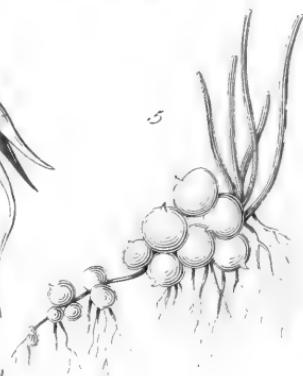
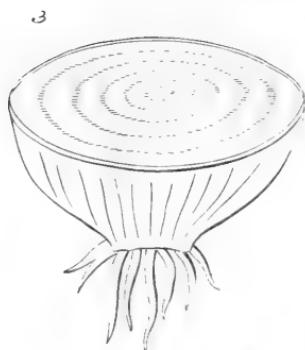
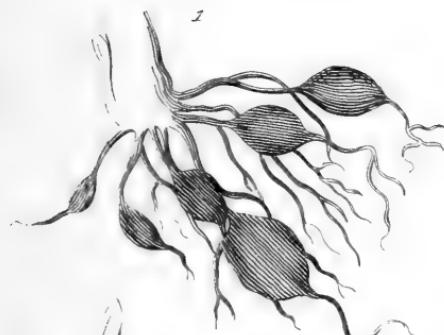


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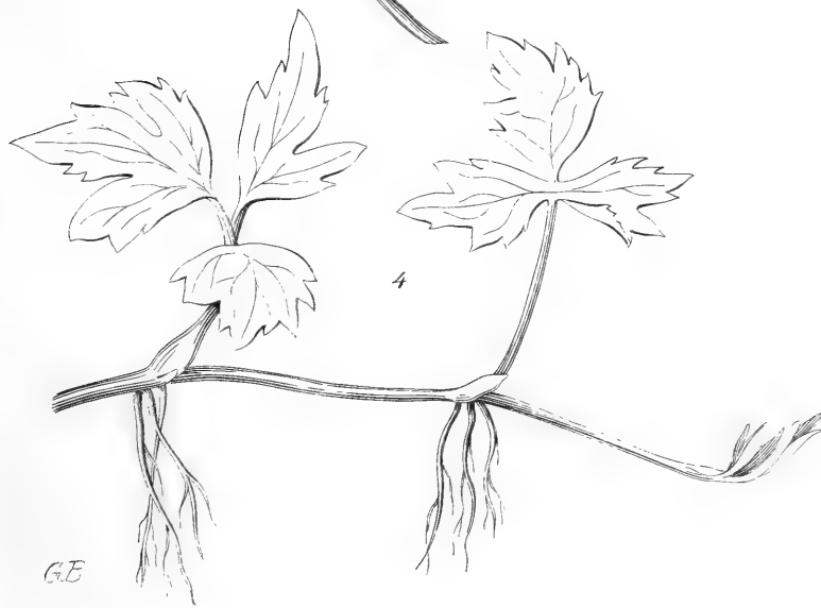
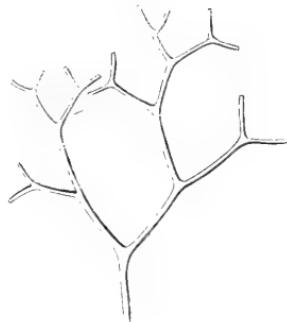
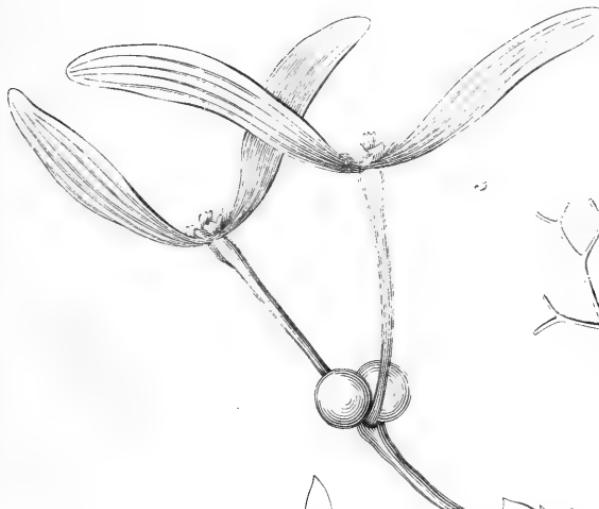
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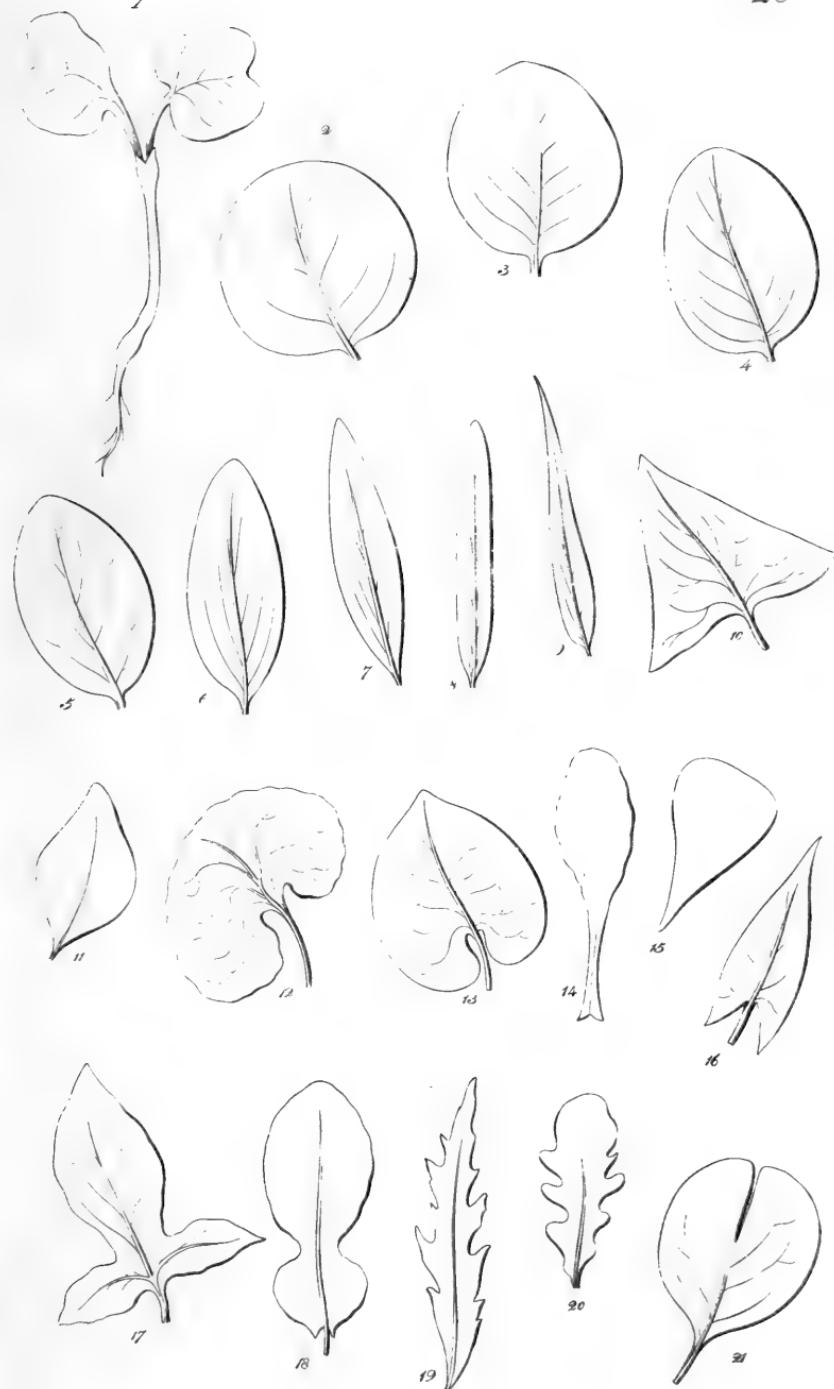
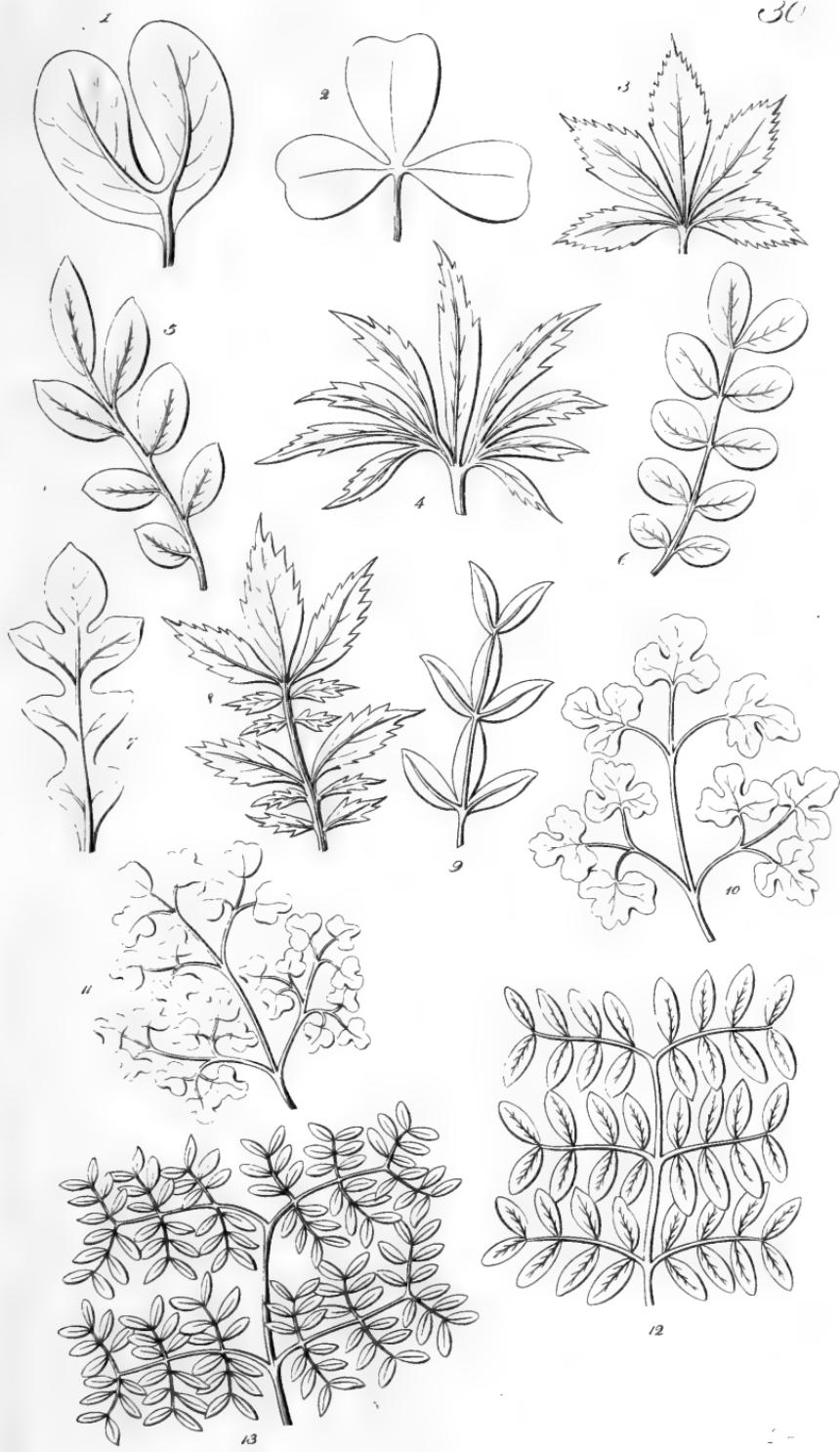






Fig. 29



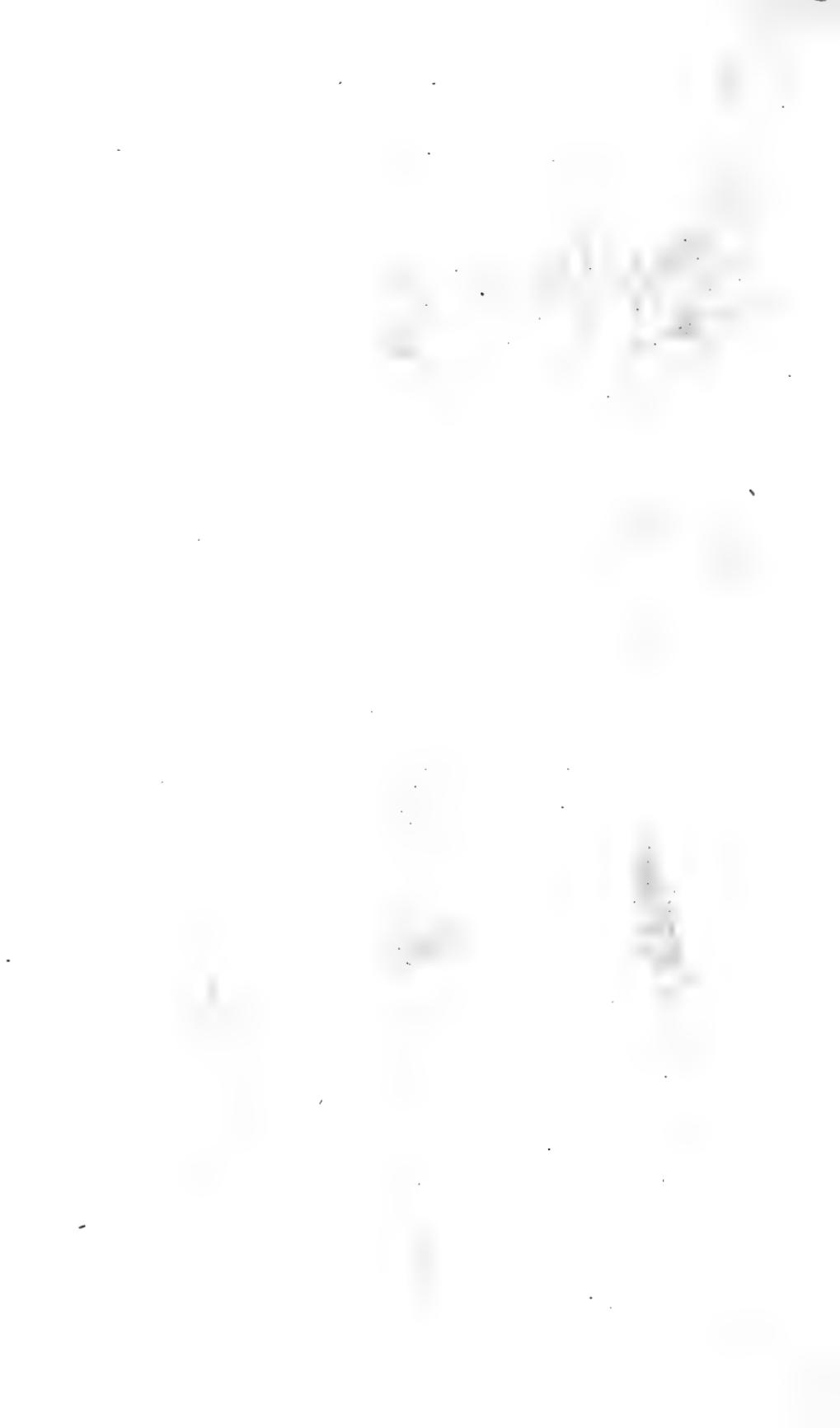




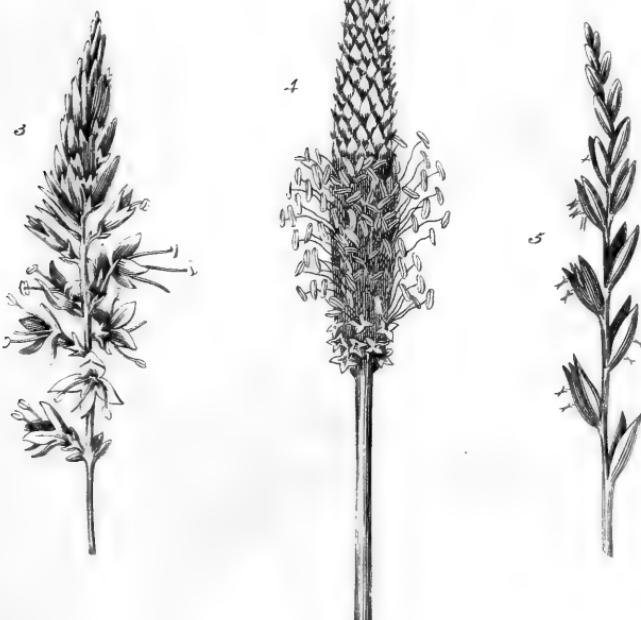
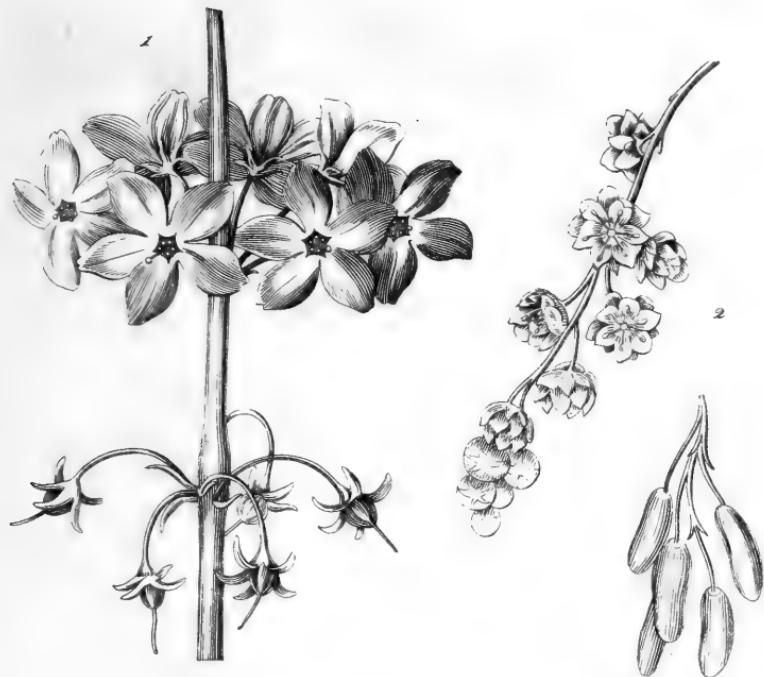




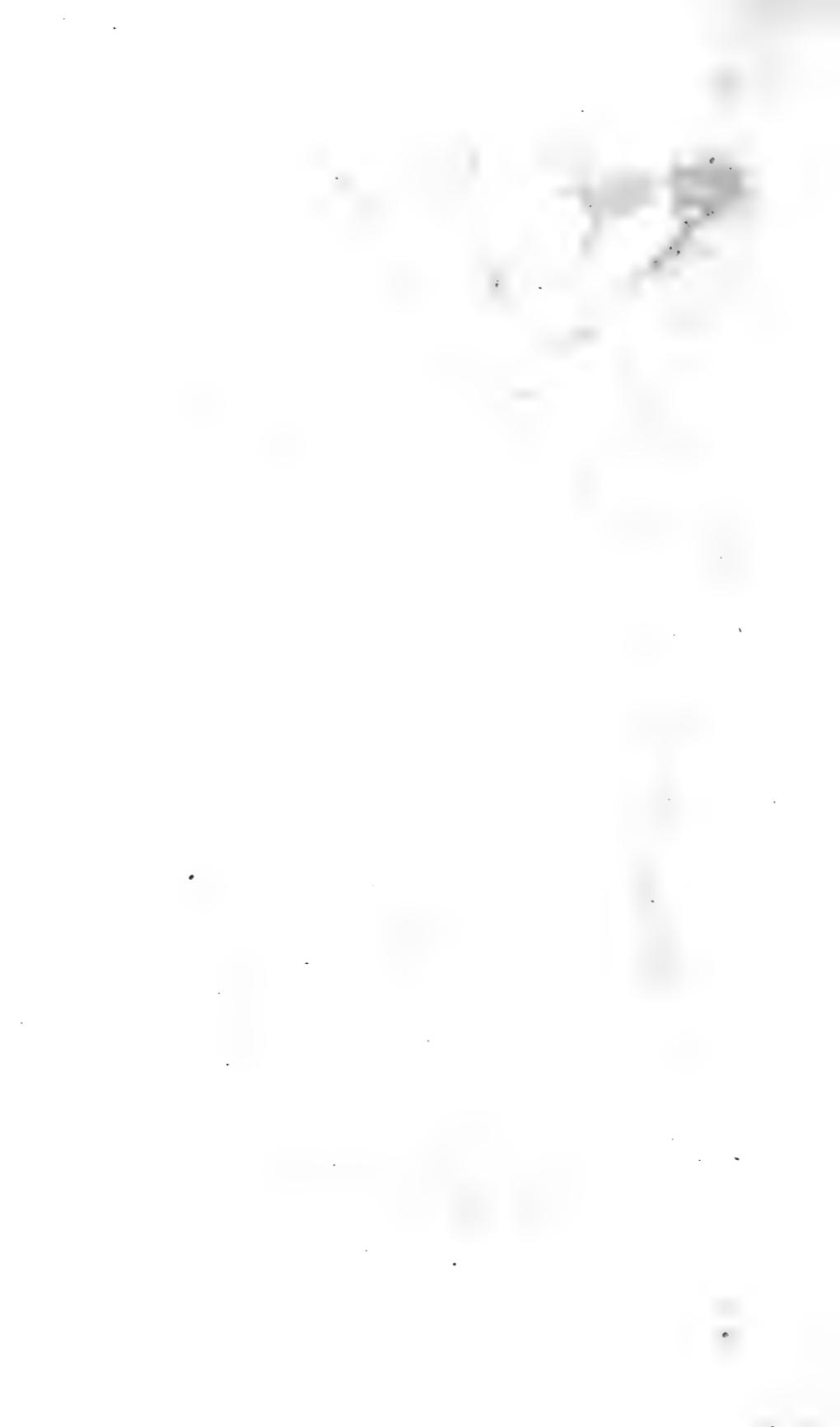


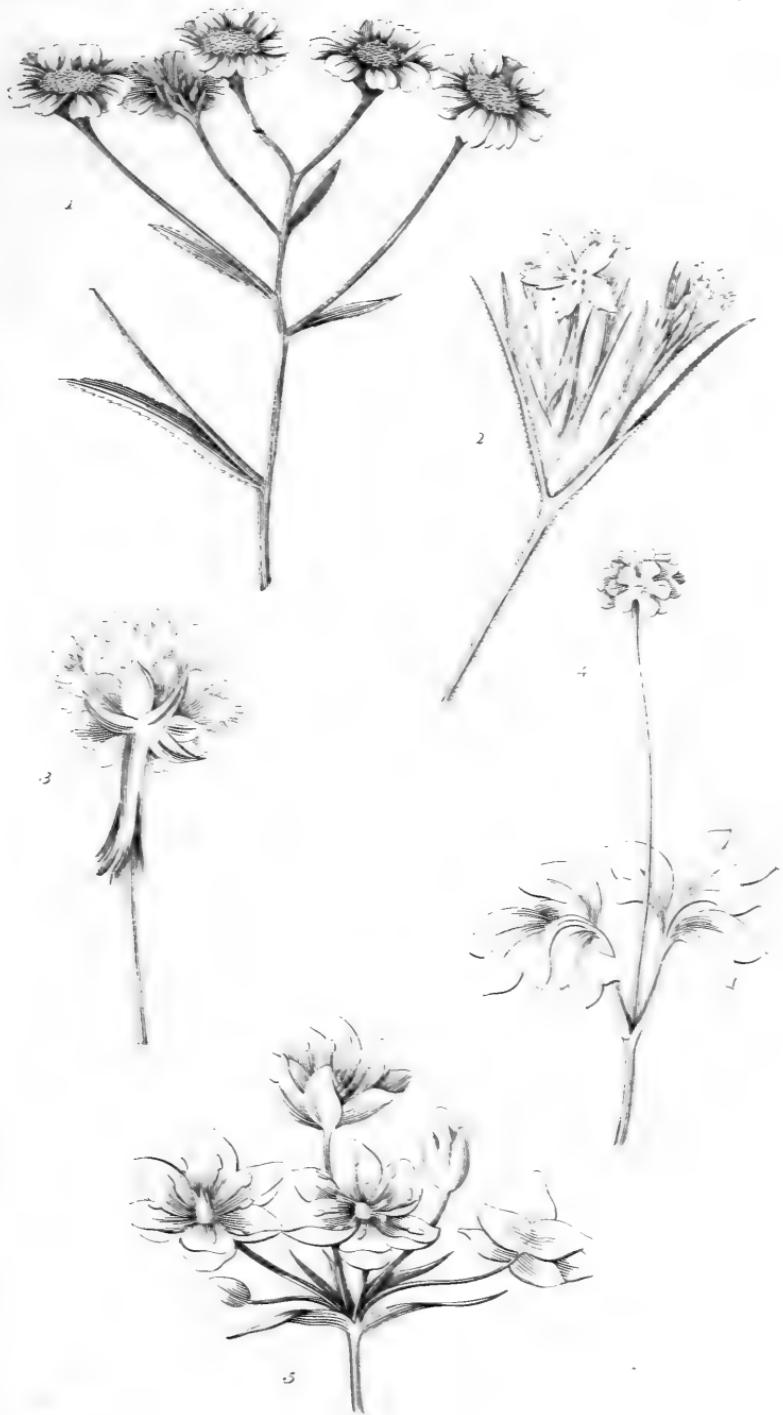


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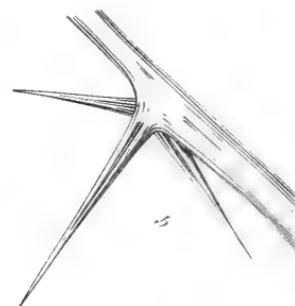
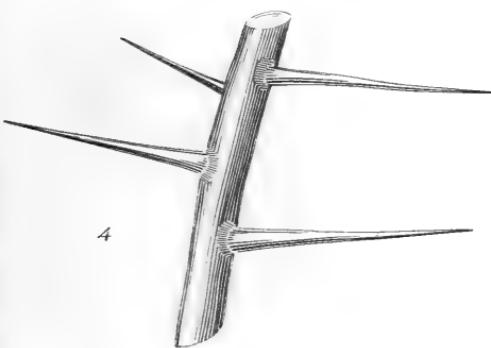
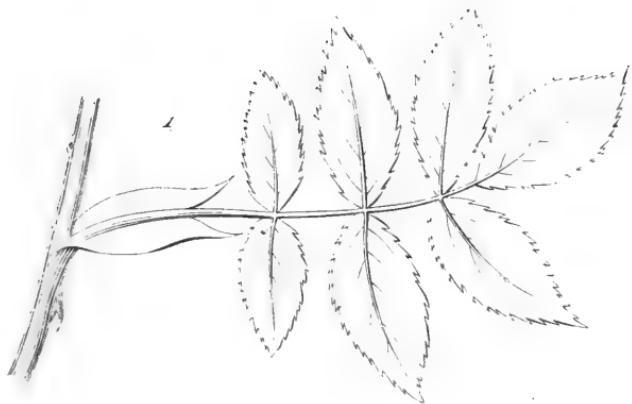


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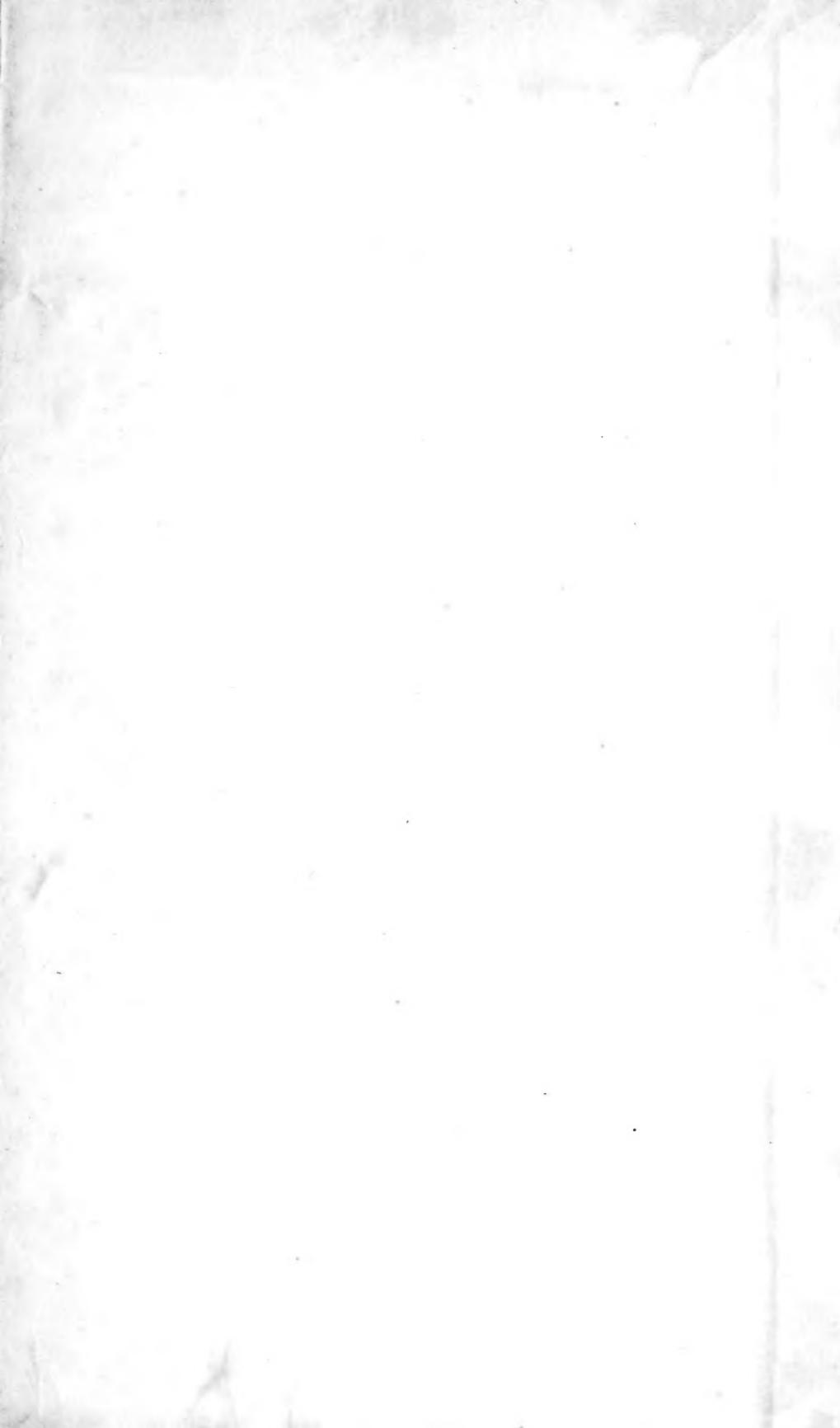
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